CUK-H04143-23-P001660

23

Aslib Proceeding

The resources of the British Library *H. T. Hookway*

Access to resources through the British Library Lending Division *Maurice Line*

Resources research: Aslib R & D and the future *John Martyn*

Sheffield World Metal Index: an account of its history and present state of development *Angela M. Allott*

No 1 TO 8

JANUARY 1975
VOL. 27, NO. 1

The Missing Persons Bureau.

Is it McDonald or McDonnell who's the physicist at Oxford? Dr. Arnold is with the Wistar Institute, but where's that? Is there anyone working nearby who might want to participate in our next seminar? How can I get in touch with Prof. Mayhew?

The next time someone asks you to track down the correct name or whereabouts of a scientist or an academic, industrial, or government organization, you can find the information quickly and easily with whatever small clue you've got. *IF* you go to the missing persons bureau—*ISI's Who Is Publishing in Science® (WIPIS),* the international directory of publishing scientists.

WIPIS quickly gives you answers to your "who" and "where" questions because we've designed it specifically for that purpose.

First, we made *Who Is Publishing in Science* comprehensive. Each *WIPIS* Annual includes the names and addresses of authors whose articles appeared in the world's most important scientific journals during a specified year. (The 1974 *WIPIS* Annual, for instance, covers every issue of almost 4,500 journals published in 1973 to give you the addresses of 270,841 scientists and over 36,000 organizations in 159 countries.)

Then we made it easy for you to find precisely what you're looking for by indexing *WIPIS* 3 ways: by *author name*, by *organization name*, and by *geographic area*. That's why almost any clue will lead to the answer you're after.

With *WIPIS* in your reference section, you'll find it extra easy to

- Get authors' addresses for reprint requests
- Determine what scientific and technical organizations are located in a specified area
- See whether an author published during a given year
- Verify the spelling of authors' names
- Determine what organization an author is associated with
- Help researchers locate colleagues
- Contact speakers and participants for seminars, symposia, etc.
- Differentiate between authors with similar names

***Who Is Publishing in Science* gets you the answers to some of the toughest day-to-day questions a librarian encounters. Quickly. Efficiently. Bring the missing persons bureau to your library. Just use the coupon below.**

ISI's WHO IS PUBLISHING IN SCIENCE®

©1974 ISI

ISI® **Institute for Scientific Information**
325 Chestnut St., Phila., Pa. 19106, U.S.A., Tel: (215) 923-3300, Cable: SCINFO, Telex: 84-5305

Please enter my order for the following Annual(s) of *ISI's Who Is Publishing in Science®* at $100.00:

☐ 1974 (covers authors who published in 1974) Available immediately.

☐ 1975 (covers authors who published in 1974) Available approximately June 1975.

Name ____________________ Title ____________

Organization ____________________

Address ____________________

City ____________________ State ____________

Country ____________________ Zip ____________

☐ Payment Enclosed ☐ Payment in Process ☐ Please Invoice 13-411

P1660

Aslib Proceedings

VOLUME 27 JANUARY 1975 NUMBER 1

010.5
As52 Proc.

© 1975 Aslib and contributors

Aslib Proceedings *is published monthly and supplied free to members of Aslib. Subscription rates are £18.00 annually to non-members, or £9.00 to Aslib members requiring additional copies. Single copies £1.70, or 85p to members.*

Further information about Aslib's services and membership rates will be supplied on application to the Director, Aslib, 3 Belgrave Square, London SW1X 8PL. Tel: 01-235 5050. Telex 23667; answer-back, Aslib London.

Notes for contributors

Aslib Proceedings now accepts contributed papers in addition to those presented at Aslib meetings and conferences. They should be of a practical nature and of some relevance to problems encountered in the everyday operation of library and information units, or services. Other kinds of contribution which will be considered for inclusion are short notes on new information units or special libraries; the introduction of new techniques or systems in existing libraries where these may be of general interest; equipment designed by members for special purposes and put into operation in their own organizations; and objective reports on experience with new 'packaged' commercially available information services.

Contributions, which should be typewritten, double spaced, single-sided on A4 paper, and not more than 3,000 words in length, should be addressed to the Editor, *Aslib Proceedings*, 3 Belgrave Square, London SW1X 8PL. If possible, authors should include a summary of up to 200 words with the typescript. Authors will receive twenty-five offprints of their article free of charge.

Errata

HALL, J. Publicity and promotion for information services in university libraries. *Aslib Proceedings* 26 (10), October 1974, p. 391–5.

p. 391, para. 1, line 13, for 'seminar[1]' read 'seminar[2]'.

p. 392, Table 1, col. 5, line 5, for '35' read '34'; col. 5, line 6, for '58.3' read '56.6'.

The resources of the British Library*

H. T. Hookway

Chief Executive, British Library Board

Paper presented at the 48th Aslib Annual Conference, Churchill College, Cambridge, 22nd–25th September 1974

Abstract

The British Library has been in existence for just over one year. It is organized in three operational divisions—reference, lending and bibliographic services—together with a central research and development department. The new library includes the former British Museum Library, National Reference Library for Science and Invention, National Lending Library of Science and Technology, National Central Library, British National Bibliography and the Office for Scientific and Technical Information. It has been planned to be at the hub of the United Kingdom's library services. The now important activities of the Library are described and an indication given of how these activities help to make the services of other libraries and information services more effective.

MR CHAIRMAN, LADIES AND GENTLEMEN, first of all I should like to apologize for being unable to read this paper myself, and to thank Mr Richnell, who is well known to you all, for his kindness in agreeing to present the paper on my behalf. In these exceptional circumstances I have written a short paper concentrating on a few important points. I have no doubt that Mr Richnell and Mr Line, whose own paper on the work of the British Library's Lending Division follows this paper, will be prepared to answer questions you may ask about this brief over-view of the resources of the British Library.

But what is the British Library, and is it now fully developed? A. E. Housman, when asked to define poetry said 'He could no more define poetry than a dog could define a rat; but he thought they would both recognize them from the symptoms they cause'. In some ways one could say the same of the British Library at this stage of its development—and one can certainly recognize it from the symptoms it causes!

Although it is not easy to give a precise definition at this stage of the British Library as it will be when fully developed, I can remind you of some features that will help to make the process of recognition somewhat easier. As all of you will know, the British Library has been formed from the former library departments of the British Museum: that is, the Department of Printed Books, including the National Reference Library of Science and Invention, the Department of Manuscripts and the Department of Oriental Manuscripts and Printed Books, together with the National Central Library, the National Lending Library for Science and Technology, the British National Bibliography, and

---

* Due to the unfortunate and unavoidable absence of Dr Hookway, this paper was read by Mr D. Richnell, Director General, British Library Reference Division

Aslib Proceedings, 27 (1), January 1975, pp. 2–7. Printed in Great Britain

the Office for Scientific and Technical Information. The resources at the disposal of the new Library are, by British standards, substantial: for the current financial year expenditure is estimated at over £12 million, and there is a staff of 1,700. The Library's functions have been grouped in three operational divisions: reference, lending and bibliographic services, together with a central administration and a research and development department. The British Library Board is the Statutory Authority charged with managing the Library. It has a part-time Chairman, a full-time Chief Executive who is also Deputy Chairman, three other full-time members who have responsibility, as executives responsible to the Chief Executive, for the three operational divisions and nine part-time members.

It is important, however, to realize that this great new organization, despite the invaluable work of the Organizing Committee for the British Library, did not spring into being fully fledged and operational; nor indeed could it have done so in the best of circumstances, and in the event a variety of problems has resulted in a delay in the transfer of the British National Bibliography to the Library and the setting up of the Bibliographic Services Division of which it is an important element until mid-August of this year; OSTI was not transferred until April; and the Library staff are still on a wide range of pay scales and conditions of service pending Government agreement on a unified pay and grading structure. Indeed, the Library was only created in July of last year and so we are talking about the activities of an organization that has been in existence for less than fifteen months.

In these circumstances, I think you will agree we have been wise to concentrate on the immediate problems associated with welding the Library into a coherent whole, ensuring that existing services were maintained at least at the same level and, if possible, improved, and setting in train the basic planning to improve and extend the Library's facilities.

But within what sort of framework does the British Library Board develop its policies, dispose of its resources, and determine its priorities? First there is the legislative framework provided by the British Library Act. The Act specifies that the Library is to consist of a comprehensive collection of books, manuscripts, periodicals, films and other recorded matter, whether printed or otherwise. It follows that the Government, in determining the level of resources to be made available to the Library, has to bear in mind this broad remit. It also specifies that the Library is to be managed as a national centre for reference, study and bibliographic and other information services in relation both to scientific and technological matters and to the humanities: thus two important principles are established—the Library's activities can cover information services of all kinds and it is to cover all subject fields. A further point is that it is within the powers of the Board, so far as they think it expedient for achieving the objects of the British Library Act, and generally for contributing to the efficient management of other libraries and information services, to carry out and sponsor research; and to contribute to the expenses of library authorities or others providing library facilities, whether for members of the public or otherwise. It is evident therefore that not only is the British Library intended to be well equipped to provide central services for users throughout the country, but it also has the legal powers to act as an agent of the Government in promoting the growth of more effective library and information services.

The British Library is the principal national depository for British copyright publications, the producer of the national bibliography, the central library institution for loans, a major developer and operator of computer-based bibliographic and other information services, and the main source of support for research in library and information science. Given this concentration of central functions and the substantial resources in money, highly skilled staff and printed and manuscript material of all kinds, the Board's policy is to develop the Library so it is at the centre—the hub, as it were, of the nation's library services. It has been fashionable to think of the national library as standing at the apex of a country's services, but the apex of a hierarchically structured system is all too frequently remote, difficult of access, and unaware of the operational and policy problems of those at lower levels in the hierarchy. To try to be wise all on one's own is sheer folly, and the British Library cannot, and must not, become isolated from the other elements of the library services of the nation. The Board will soon be setting up far-ranging advisory machinery covering all major aspects of the Library's activities so as to reflect fully the views of users. The intention is that the advisory machinery should be one of the most important channels of advice to the Board both in terms of policy formulation and operations. After all, the Library can only develop the use of its resources to the full if there is consultation and agreement with libraries, information services and other users so that its policies and operations are broadly acceptable. Within the framework and philosophy I have outlined it is the Board's policy to concentrate its efforts on making the resources of the Library more readily available and to ensure that the Library plays its part in helping to foster the development of a closely articulated national system of library and information services.

Turning now to the operational divisions, I hope I can demonstrate by appropriate examples that we are having modest success in deploying our resources more effectively. I shall invite you first to look briefly at the Reference Division of the Library; no doubt Mr Richnell will amplify and extend my remarks if necessary. This Division comprises the former library departments of the British Museum. The nation possesses in the collections of these departments one of the most comprehensive collections of books, manuscripts, maps and music scores in the world. It is no easy task to exploit these outstanding national assets to the full, while bearing in mind the Board's responsibility to conserve the collections for future generations. Until a new building is provided the books—in ever increasing quantity—the staff and the readers must remain where they are, scattered in a multiplicity of inconvenient and outmoded buildings in central London. Much depends therefore on the provision within the next decade of modern premises worthy of the nation and capable of housing the great reference collections of the Library. Nevertheless, much can be done and is being done to ameliorate the situation by better organization and utilization of the limited space available and by rationalization and reorganization of services. Future activities are being planned so as to provide all the essential central reference services on the basis of which other libraries can build up their own collections and services. The reference facilities of a national library are often regarded as providing Library Services of a 'last resort', or back-up nature and to an extent this is true of the Reference Division of the British Library. However, over 15 million people live within a fifty mile radius of the Division's libraries in central London and in a very real sense it is a library of first resort for them, especially for workers in commerce, planning, science and technology. If the resources of the Division are to be exploited to the full, those who visit the Library and those who study elsewhere must have quickly and in the appropriate form as much information as possible about the nature, scope, and depth of the Library's holdings.

To provide this information requires the development of a wide range of new bibliographic services and the improvement of existing ones. The Bibliographic Services Division will play a major role in providing these services, and others designed to ensure the country as a whole has ready access not only to the collections of the British Library, but in addition, through international co-operative arrangements, with those of other countries.

It is self evident that an effective and economical bibliographic network is essential if libraries are to function at optimum efficiency. The high cost of providing bibliographic access to materials requires the development of co-operative and centralized arrangements for the services required. Computer-based services are obviously attractive in this context because they enable one to process much larger quantities of information than can be done by manual means; the costs of handling these even larger workloads are stabilized—for, unlike manual system costs, machine costs do not rise linearly with the workload; and new products and services can readily be generated. It is noteworthy, therefore, that the Bibliographic Services Division comprises the former functions of the British National Bibliography together with those of the Copyright Receipt Office and certain other functions of the former library departments of the British Museum. The operations are already computer based, and the Copyright Receipt Office will soon be providing the listing of all legal deposit material at the library.

The general approach of the British Library towards providing bibliographic services for the Library and information community is that it should provide the route for data communication and transfer between the national bibliographic data banks, including of course the British data banks, and the British library community.

In following this policy, the central services provided now by the British Library, and those to be provided in 1975 and later years, have been planned to lead to the rapid growth of computer-based networks in Britain. At present, the Library's MARC tapes service can provide, for current cataloguing, a bibliographic listing, catalogue cards and machine readable cataloguing input. The machine readable input can be processed directly by an individual library, a library authority (where the central library would presumably do the job), by a region, or by the British Library, which is prepared to offer a selective service of catalogue records covering the additions to stock of individual libraries and merging its MARC records with records produced by libraries of books added to stock which are not covered by MARC tapes. The balance of advantage as between these various approaches depends on the resources of the library or library system involved. The terms on which the tapes or individual records are made available have been designed to ensure the maximum local utilization of the centrally generated system, while maintaining enough control to avoid the creation of many competing quasi or para-national files.

A further step has been to convert the British National Bibliography, back to its beginning in 1950, to machine readable form in MARC compatible format. This new data bank will be of particular value to the new library authorities described earlier in this paper who face the task of building catalogues of the combined holdings of the former authorities, and whose stocks of material consist largely of items listed in the National Bibliography.

By the end of the year all the regions will be operating a system first set up, with Government development support, by the London and South East Region (LASER) for recording accessions in numerical form by International Standard Book Number (ISBN), with coded library locations, and sorting by computer. The ISBN–location lists are produced as computer output on microfilm and can be used for interlending in two ways: either libraries apply to regional headquarters, which supplies them with a location, or they can buy the microfilm catalogues and borrow direct from one another. The system is both cheap and efficient, and the British Library does the processing centrally at no charge to the regions. It is possible therefore to integrate all the records to make a comprehensive ISBN catalogue for the intake of public libraries in the country. This will be important both at the national and the local level for determining acquisitions policy, as well as increasing the efficiency of interlending.

From 1975, the machine-based current cataloguing activities will be extended to all British Library intake. It will then be possible to provide a range of new services covering the areas of British Library intake that are not part of the MARC service provided at present. On line access within the Library is being provided for, on an experimental basis, and may be available to other users, but in the immediate future the relatively high telecommunications costs in Britain may inhibit rapid growth of use outside the Library. A decision will have to be taken soon on whether to convert the existing manually-produced catalogues. The cost will be high, but the benefits are likely to be great for libraries throughout the world. We should be able to decide what to do later this year, when our analyses of the problems and costs are complete. These developments are likely to be of particular value to university and other research libraries since they will be able to redeploy their own resources more effectively if they accept the new central services and adopt the same standards.

Another effective way of providing access to the collections is of course through inter-library lending which is now a very large operation in Britain. Mr Line will be giving you a presentation in depth of the work of the Library's Lending Division, formed from the former National Lending Library for Science and Technology and the National Central Library, which has been planned to extend and further improve these activities. About two million requests a year are sent to the British Library, and demand is increasing steadily. I do not propose to duplicate what Mr Line will say, but I should like to make one or two observations of a general nature. First, the main factors accounting for the growth of demand on the central facilities are the acquisition programme of the Lending Division—which now aims to acquire all significant serials and reports in all languages, together with English language monographs—and the speed with which loan requests are met. The Library's Lending Division meets about 84 per cent of the demands made on it by direct loan from the central stock. The main burden of interlibrary lending has therefore been lifted from individual libraries, who are free to adapt their acquisitions and stock-holding procedures accordingly. From the national viewpoint, the interlending process is not only quicker and more efficient; it is also cheaper. But although the central lending collection is large it has to be supplemented by the resources of other libraries, and therefore it has been important to ensure that an appropriate network of cooperating libraries is set up to meet the deficiencies in the central stock. Union catalogues provide access to the holdings of many libraries. In addition, in the interests of efficiency of the overall operations, we have made special arrangements with a limited number of libraries with very large or special resources to provide a back-up service. The number of requests made is fairly substantial, the cost of dealing with the requests is not negligible, and there is need for rapid response. We therefore pay these large co-operating libraries for their services so as to ensure they can deploy adequate resources to meet our requirements.

Finally, a word about research. The research and development department of the library comprises the functions of OSTI, extended to include work in the humanities, together with a systems team concerned with studies and development of the Library's future computing and allied requirements. The pioneering work of OSTI will be continued and extended in the Research and Development Department, and the tradition of consultations and arrangements for independent refereeing of projects will also continue.

In this short talk I have not attempted to describe in depth the activities of any of the divisions, nor to talk about the existing information functions of the Library. Those concerned with science, technology and related fields have been admirably discussed in Aslib meetings by Michael Hill of the SRL and there have been many talks on other facets of the British Library's activities including the work of OSTI. For this 48th anniversary meeting I have attempted to give you some kind of feeling for the Library's philosophy and for the way in which it is planning its activities, and to give a few examples of developments and aspects of the Library's work that may not be well known to Aslib members.

As a last word, may I say what an honour it is to have been able to contribute to the Conference associated with Aslib's Jubilee, and repeat my apologies for being unable to attend in person.

Access to resources through the British Library Lending Division

Maurice Line

British Library Lending Division

Paper presented at the 48th Aslib Annual Conference, Churchill College, Cambridge, 22nd–25th September 1974

Abstract

The British Library Lending Division (BLLD) is the main source in the United Kingdom for supplying documents not held locally.

The most important features of the system are: the high volume of demand; the fact that all significant serials, reports and English language monographs, between them accounting for the overwhelming majority of demand, are acquired for the central lending stock; and the design of the system for speed of service and low unit cost. The volume of demand is currently about 2,200,000 items a year, growing at over 20 per cent per annum. The BLLD is able to meet about 84 per cent of requests from stock, and an additional 9 per cent are supplied with the help of other libraries. Weaker parts of the system are gradually being strengthened by various means; these include greater access to the copyright libraries and other 'back-up' sources, the photocopying of older serials in the British Library Reference Division and improved lending arrangements with other countries.

Detailed figures on supply rates are given. Future problems and developments are considered.

THE UNITED KINGDOM, and indeed the rest of the world, have not been left in complete unawareness of the development and performance of the British Library Lending Division (BLLD) and its predecessors, the NLLST and the NCL. I venture to speak about it now because a session on access to resources would hardly be complete without something on the most comprehensive centralized access system in the world, and because the merging of the NLLST and the NCL in July last year to form the Lending Division of the British Library has led to some major changes and developments which significantly alter the interlending situation in the UK. This paper, then, is an up-to-date review of the present position, with some statistics hot from the computer.

It is worth noting to start with that only in the UK is lending, as a function of the national library, accorded equal status with archival and reference functions and the provision of bibliographies and cataloguing services. It accounts in the current year for an expenditure of £3.25 million, of which £0.75 million is recovered through the sale of loan forms and other services. The number of requests received this financial year is expected to be around 2.2 million, an average of 8,800 per working day, and an increase of more than 20 per cent over the previous year. This compares with about 400,000 requests

Aslib Proceedings 27 (1), January 1975, pp. 8–15. Printed in Great Britain

on the regions made in 1973/74 (which may increase to about 430,000 in 1974/75). The amount of borrowing in response to direct requests by libraries is unknown; it may be around 300,000 to 400,000. Since these figures are for *requests*, and unsatisfied requests may be passed from one channel to another, there will be some overlap between them, but it looks as if we are currently handling nearly three-quarters of all interlibrary loan requests dealt with in the UK. Tables 1–3 show the subjects, forms and sources of requests reaching us.

	%	
Academic	38	
Universities		25
Polytechnics		7
Other		6
Special	45	
Industrial & Commercial		21
Government		13
Other		9
Public	8	
Overseas	9	
Miscellaneous	1	
	100	

TABLE 1: *Sources of requests received by BLLD*

	%
Science & Technology	75
Social Sciences	13
Humanities	9
General & Miscellaneous	3
	100

TABLE 2: *Subjects of requests received by BLLD*

	%	
Monographs	23	
English language		21
Foreign language		2
Serials	67	
English language		56
Foreign language		11
Reports, Official publications, etc.	4	
Conferences	5	
Dissertations	1	
	100	

TABLE 3: *Forms of requests received by BLLD*

The aim of the BL Lending Division is to acquire for loan stock as comprehensively as possible those categories of material most in demand, or for which demand is substantial and which are hard to obtain otherwise. So we are acquiring currently all 'significant' English language monographs, excluding fiction; all 'significant' serials, in all languages and subjects; all report literature publicly available; all British official publications; and some other categories, such as Slavonic science monographs, and US dissertations. In some categories, the collection goes back only a few years (e.g. English language monographs in the humanities and social sciences); in others it goes back as far as it can by retrospective acquisition. Most of the categories of material we do not acquire—by far the most important being foreign language monographs—are so large in quantity, and the demand so relatively slight, scattered and unpredictable that we could never justify comprehensive purchase. Our current acquisition budget is around £1 million.

It may seem a highly wasteful procedure to buy comprehensively not only items that other libraries are unlikely to have but items that many of them are known to have, such as current British books and high status scientific serials. There are several excellent reasons why we do this. The first is that a library devoted almost entirely to interlending can give a faster and more efficient service than a local library, even when the latter has the required items on the shelf; in fact, commonly held and commonly wanted items are often not on the shelf, and even when they are, a library may be reluctant to lend them. The old NCL system of relying on other libraries to supply wanted items was, as many of you know from painful experience, often very slow, and had a high failure rate. Even now, when we need to call on other libraries much less, and mainly for items they are most unlikely to have discarded, the percentage of items supplied as a result of locations given to requesting libraries is less than 70 per cent,[1] and the median time taken to supply items is 15 days. Secondly, decentralized access means dispersed responsibility, to keep as well as to lend, and it benefits all libraries if this responsibility is centralized. Finally, it is difficult except from a central stock to fulfil an international responsibility for lending British publications to other countries—of which more later.

If we had comprehensive retrospective collections of the main categories, we would be able to satisfy over 95 per cent of all demand in the UK from our own stock. As it is, our overall success rate for valid requests from stock is 84 per cent; I say 'valid' because many requests are garbled, or are for items not yet published. The success rate varies considerably between different categories of material (see Table 4).

Our best service is still in serials, with a 91 per cent satisfaction rate from stock; even in the humanities, where the positive collecting of serials began only 2 or 3 years ago, 67 per cent of requests are being supplied from stock. For monographs, we are meeting 58 per cent of all requests from stock, and here we are doing rather better in the humanities than in the social sciences, though we are doing better in science than either. The more recent the book, the greater the chance it will be in stock; 82 per cent of valid requests for English-language books published in 1970 and 1971 are being satisfied from stock. However, we possess a surprising number of the older and foreign language

	TOTAL REQUESTS RECEIVED	REFERRED BACK TO REQUESTER		TOTAL VALID REQUESTS	VALID REQUESTS SATISFIED									
		n	% of total received		*from BLLD stock* n	%	*from locations supplied** n	%	*Sent to back-up libraries* n	%	*Sent abroad* n	%	TOTAL SATISFIED n	%
Monographs	3,065	415	14	2,650	1,615	61	482	18	133	5	39	1	2,269	86
English language	2,790	381	14	2,409	1,552	64	427	18	93	4	16	1	2,088	87
Foreign language	275	34	12	241	63	26	55	13	40	17	23	10	181	75
Serials	9,008	659	7	8,439	7,630	91	67	1	255	3	39	<0.5	7,991	96
English language	7,527	537	7	6,990	6,480	93	54	1	170	2	26	<0.5	6,730	96
Foreign language	1,481	122	8	1,359	1,150	85	13	1	85	6	13	1	1,261	93
Conference proceedings	785	133	17	652	530	81	23	4	5	1	3	<0.5	561	86
Reports, Official publications, etc.	535	75	14	460	385	84	13	3	3	1	4	1	405	88
Dissertations	95	21	22	74	54	73	1	1	0	0	10	14	65	88
ALL CATEGORIES	13,488	1,303	10	12,185	10,224	84	586	5	396	3	95	1	11,291	93

* Calculated at 70% of items for which locations are supplied.
† Satisfaction rate not known at time of survey: counted as 'satisfied'.

TABLE 4: *Satisfaction rates for different categories of request*

books that are wanted on inter-library loan: for example, we can supply a quarter of requests for foreign language books. Monographs and serials between them account for 90 per cent of the demand on us, the rest consisting of requests for reports, official publications, conference proceedings, dissertations and sundry other categories. The recent survey (May 1974) from which the figures I have quoted come has helped to indicate areas of relative weakness, and there should be a gradual improvement in most of these supply rates, especially for monographs, as the stock builds up over time.

Our main problems are of providing access somehow to items that are not supplied at present, and of providing faster access to items which are at present delayed, whether because of our own waiting lists or because other libraries are slow in supplying. We have taken several steps in the last year or two to try and improve the situation.

First, we have tried to improve the performance of the union lists. We have filmed the catalogues of some important libraries not hitherto represented in them, including several small special libraries and one or two very large ones. We no longer need entries for current English language monographs acquired by other libraries, and libraries submitting entries are now confined to those with a substantial intake of foreign language and older English language monographs. During this rationalization process, several libraries have begun to contribute that had not previously done so, so that instead of a large number of libraries of varying usefulness, we now have 60 or 70 of maximum usefulness. The input into the union lists in 4 or 5 years' time will be only around 30 per cent of the input last year, and this will result in a much more manageable list, which we hope to keep in machine-readable form.

A second major step we have taken is to make special arrangements with selected other libraries. Requests are passed direct to these libraries, which are not given as locations to requesting libraries, and we pay them an agreed amount for each satisfied request. In the case of serials, they are used in preference to other libraries; for monographs they are used as a last resort in the UK, since they do not normally lend. Most of these libraries are private libraries, such as the London Library, the Royal Society of Medicine, and the Linnaean Society. Much the most important of these back-up libraries are the legal deposit libraries (other than the British Library Reference Division); these are excellent sources for British books and older humanities and social science serials. This back-up system has been operating fully only since April this year, but it appears to be working well, by providing access to numerous items hitherto unobtainable on inter-library loan in the UK. The number of requests sent to these back-up libraries may reach a total of 40,000 a year.

The next improvement would not have been possible before the British Library came into being. We are now using the BL Reference Division to supply photocopies of serials we do not hold. We may send to the Reference Division some 25,000 requests a year. The Newspaper Library at Colindale is shortly to be involved in this arrangement.

At the international level, IFLA has recently accepted the principle that each country should be responsible for making available on loan to other countries copies of its native publications. If this can be achieved, it will improve access greatly, but progress is bound to be gradual. We are also trying to improve the speed of international lending and to simplify procedures and accounting, perhaps by the adoption of a pre-paid system based on a form like the BLLD form. It may be noted incidentally that 200,000 requests a year are received by the BLLD from overseas—this appears to be a very high proportion, perhaps as much as a third, of all international lending in the world. The BLLD is therefore in a good position to suggest improvements and pilot new procedures for international lending.

These recent developments should reduce substantially the number of failed requests, especially for serials and British monographs. With the various supporting facilities now available to us, to the 84 per cent of valid requests supplied from our stock can be added 9 per cent from other sources. These sources supply 4 per cent of requests for serials, and 23 per cent for monographs (see Table 4). However, we have not solved the problems of items in heavy demand, particularly recent English language monographs. We have found no way of identifying in advance those books most likely to be wanted; and we cannot afford to go in for mass duplication. Nor is purchase of extra copies when the demand arises a solution, since many or most of the books are American and take some time to obtain. The problem is alleviated by the regional systems, which are able to absorb much of the demand for recent British books, and when all the regions have their current entries recorded by ISBN we should be able to obtain locations for many items by consulting a consolidated ISBN list on COM.

This problem of materials in high demand will almost certainly continue to be a serious one. The most recent items are the ones that libraries are most unwilling to lend, even when they have them; the success rate at locations for 1972–73 books is less than 40 per cent.[1] There is more than a suspicion that much of the demand on us for very recent books (including some not yet published) comes from libraries which are using us as an 'on approval' service. This is not necessarily a bad thing, except when it deprives libraries who really do need books here and now from having them. It may not matter too much while the books can be bought by libraries, so long as we have one or two copies for the time when they go out of print; our satisfaction rate for books more than 2 or 3 years old is much more important, since these may be totally unobtainable otherwise.

What more can we do? So far as access in the UK is concerned, there is one possible major improvement. It is known that nearly half the items for which we currently have to apply abroad are in the BL Reference Division. The possibility is now created, with the establishment of the British Library, of a joint acquisition policy between the Reference and Lending Divisions, whereby foreign language titles can be acquired for both reference and lending purposes. This matter has still to be discussed by the British Library Board.

Up to now we have provided only partial access to printed music. We are now about to acquire as they are published all individual scores (*not* sets of orchestral and chamber music, or multiple copies of vocal scores) of a kind likely to be wanted on inter-library loan, as well as buying retrospectively all such items still in print. This development should meet a need that is known not to be adequately served at present.

Another improvement will gradually come about anyway, as increased pressures on space cause more and more libraries to dispose of lesser-used material to Boston Spa, where accommodation is cheap and where items are easily accessible to the libraries that discard them as well as to the rest of the country. Our main problem here may be in channelling a possible flood so that material reaches us in quantities we can handle.

The conversion to machine-readable form of the LASER catalogue will be of value to us in itself, and of even more value if other regions use it to convert their catalogues and give us a copy.

We can speed up our replies by telex by incorporating automatic storage and response devices into our system. Computer input of requests may be the method of the future. We are exploring the possibility of facsimile transmission, slow and costly though it is, to meet very urgent requests, for which special charges would have to be made.

Two possible problems are those of transport and copyright. If the postal service deteriorates further, or even if it does not, it now looks as if an inter-library van service like that now operating in Yorkshire and Humberside would be a cost-effective alternative. More restrictive copyright regulations would of course reduce availability of serials because items would have to be lent rather than photocopied, but in fact it would be extremely difficult to show that our photocopying operations, massive though they are, significantly affect sales or profits. Of the one million articles we are copying this year, probably two-thirds or more are in issues that are now unobtainable. The remainder, some 300,000, are distributed amongst some 6 million articles in the last 3 years, from 45,000 serials. An average article from an issue in print, therefore, has a probability of 1 in 20 of being copied by us this year. In fact, of course, this copying is concentrated on a few hundred serials, the articles in which can expect on average to be copied once a year. These journals are the high status, widely held serials, the existence and sales of which are not in any serious danger—if they are, it can hardly be due to us. A further point is that university libraries have consistently *increased* the proportion of their budgets devoted to serials over the last 10 years or so, which does not suggest our service is causing them to give serials a lower priority. It is true that periodical publishers are facing serious economic problems, but this is happening also in other countries which have no effective lending or copying service. It is true also that libraries have had to cancel subscriptions as their budgets have failed to keep pace with the growth in number and cost of serials; this also has happened in other countries. The fact that two trends are apparent at the same time is not in itself evidence of cause and effect.

At the present, the BLLD is the only source of inter-library loans for many items, the main source for most, and a possible source, direct or indirect, for all. For the future, it is unlikely that the 20 per cent per annum increase in demand we are currently experiencing will be maintained—if it were, we would be handling 4 million requests in 5 years' time—but we must expect continued growth, of demand, stock, staff and buildings. It is probable that we have already taken a good deal of demand off direct lending, and some off the regions. This process may or may not continue; the important thing is not that we should monopolize all demand, but that the country's libraries should receive the best possible service, in whatever way it is provided.

Some fear has been expressed that our existence and service may be used as an excuse for keeping the funds available to other libraries at a low level. The situation is rather the other way round: we have had to develop, maintain and improve our service *because* other libraries have found their own resources increasingly inadequate to meet growing needs, and economic difficulties in the immediate future are likely to cause libraries to place still more demands on us. Beyond a certain limit, in any case, it becomes more expensive to borrow than to buy, at least in the long term, and librarians will certainly need to do comparative costing, so that they can confront any attempt to reduce their resources (relatively or absolutely) with hard figures. It is very clear to me that we are always a supporting system, never an alternative to adequate local provision.

Finally, I have already mentioned our international role. There seems no reason why any other country in Western Europe should build up another comprehensive collection of serials, although every country will need to try and satisfy a high percentage of all its requirements. While there will be no deliberate effort on our part to make the BLLD into a Western European serials lending library, this role may devolve upon us anyway. If it does, there seems no reason why we should not fulfil it.

REFERENCE

1 YAP SHOON FATT. The locations service of the BLLD: a study of its effectiveness. *BLL Review*, 2 (4), October 1974, p. 115–24.

Resources research: Aslib R & D and the future

John Martyn

Head of Aslib Research and Development Department

Paper presented at the 48th Aslib Annual Conference, Churchill College, Cambridge, 22nd–25th September 1974

Abstract

The work of the Aslib Research and Development Department during the next few years will be chiefly concentrated on problems arising in four specific areas. These are: resource provision, allocation and management; resource sharing and co-ordination; the relationship between information provision and the needs of specialized user groups in science, social science and technology; and the education of users of information. Examples of projects falling in each of these areas are given. The value of research to the individual information worker and the role of research in improving the information environment is discussed.

THE ASLIB RESEARCH DEPARTMENT was formed in 1957, following on a unanimous decision taken at the 1956 annual conference, that Aslib should provide itself with a research facility. It originally consisted of one member, Chris Hanson, one of the extremely few people to possess sufficient wisdom, experience, integrity and humanity to be able to constitute a one-man research department. At that time, the DSIR grant to Aslib was increased to assist in supporting research. In 1965, with the formation of the Office for Scientific & Technical Information and the disbanding of DSIR, a separate grant was made available which was to be spent solely on research, and the research department, which by then had reached a strength of five, increased to eight and subsequently to eleven members. Since that date, the pattern of grant support has changed several times, and the amount and range of work available to the department has increased, so that at present we have an establishment of seventeen members on the research side, and a strength of five in the Consultancy section.

However, despite the many changes which have taken place since the formation of the department, some things have not changed. I was recently looking through some of our earliest files, and three things caught my eye. The first was that in 1957 Aslib had accommodation problems, and was on the point of moving to Belgrave Square; we again have accommodation problems, and I hope that the Research Department, which is currently in three different places, is very soon moving to a new location. The second was a letter in the file, dated 1957, on the substantial contribution of research activity to the 'day-to-day advisory work for members' which occupied much of the department's time. We still find that, in spite of having a full-time consultancy section which deals on a fee-paying basis with many of the problems encountered by indi-

Aslib Proceedings 27 (1), January 1975, pp. 16–21. Printed in Great Britain

vidual organizations concerned with information handling, we spend perhaps as much as 10 per cent of our working time in 'day-to-day advisory work for members', a free service which is an entitlement of membership.

The third point I noticed was again in a letter, of 1959, discussing the formulation of the Aslib research programme, which said, 'I have not had much success when I have asked for suggestions at meetings'. It is regrettably true now, as it was true then, that we have never been successful in getting suggestions for practical research, or statements of practical problems amenable to research, from our membership. There is no lack of problems specific to particular situations, which are of insufficient generality for research treatment, and these problems, of course, are the major preoccupation of our consultancy work. Some generally-expressed problems, such as 'What is the value of information?' and 'How can I demonstrate the cash benefits provided by my information department?' are very much our concern but have so far proved intractable. Other problems, such as those concerned with the evaluative testing of ranges of specialized equipment are beyond our scope by reason of the heavy capital expenditure involved. What we would like from our membership are statements of problems which concern a number of members, so that the results of research would be generalizable and useful to a reasonable proportion of the information community, and at this point I invite any member of that community who feels he can identify such a problem to contact me or any other member of the R & D staff.

The other side of this picture is that over the years, experience has shown that the majority of research findings in information work, whether produced by ourselves or by other workers, is seldom of direct and immediately perceptible benefit to the individual information worker in the field, and the results of research can rarely be applied without modification to the solution of everyday problems. This observation, which in fact is applicable to much research in fields other than our own, is a natural consequence of the relative uniqueness of any specific set of operational problems. What we believe Aslib research *has* done, and will continue to do, is to have an effect on the environment of information work, by improving and enhancing the services and tools available to the practitioner, by seeking greater understanding of information users, and by providing data and results which contribute to the formulation of national and international policies whose implementation will affect the total picture of information provision.

How, then, can we define the role of the Aslib Research and Development Department? In the light of my preceding remarks, and remembering the role of Aslib itself as an advisory body representing both users and providers of services, I consider its role to be that of a national research facility, working in the national and international interest, whose task is to improve the collection, organization, transmission and use of information of all kinds in all fields of human activity. This task is performed by conducting research on general problems of information use and management, by interpreting research results to the practitioner, by the provision of a free advisory service to the Aslib membership, and facilities for paid consultancy and contrast research applicable to specific situations and organizations.

This statement raises questions relating to the sources and extent of funding to support our activities, but I do not wish to discuss these questions here. It also raises questions about the things we should be doing in order to carry out our role, what we are proposing to do in the next few years, and it is our forward planning that I wish to talk about for the remainder of my 20 minutes.

We feel that we can group the directions our work should take in the next 3 years under four main themes. These cover: user groups and resources, organization and management of information resources, evaluation of information tools, resources and handling methods and, in a broad sense, Marketing. I shall consider these in turn.

User groups and resources

Information resources are unevenly distributed amongst the groups who comprise the information-using community (both potential and actual). Some areas are rich in information services and sources, others have few or none. This is partly because information services had their historical origins in the sciences and have been organized in accordance with the traditional disciplinary divisions of the sciences. Increasingly, present systems of information provision fail to match the needs of many groups, often inter-disciplinary, within the sciences and technology. Many groups also, outside science and technology, have varied (and sometimes unrealized) requirements for information, which are not being met. Any attempt to organize and coordinate a future national information system must begin with the awareness of the existence of such groups, their nature and extent, the strength and types of their information need, and the degree to which their requirements are met.

Work in this area will attempt to identify groups in need of information, groups that generate information, the kinds of information generated, and all the methods, processes and stages whereby they are communicated. The long-term objective is to ensure that all groups which could use and exploit information resources have the means to do so. The Aslib research effort during the 3-year period will be directed towards the construction and testing of methodologies for collecting the required data. These methods will then be available for application by Aslib or others. Some attempts on aspects of the problem have already been undertaken, as in Aslib studies of metallurgists, needs of chemists for critical data, information needs in the construction industry, the distribution of scientific and technical libraries and users in the United Kingdom, public use of business and commercial information, and the reference requirements of Biodeterioration.

Need groups (which are not restricted to science or technology) may be defined by the use of Government classifications of employment, by survey techniques, or by a variety of other classificatory devices. The first step will be to develop and test methods of identifying groups, using a range of techniques. One possible approach to measuring the extent of a group's information requirement may be via a 'need-indicator', a number similar in construction to a statistical index number, which may be calculated for groups under study by combining measurements or estimates of a relatively small number of their characteristics. Hopefully a similar 'indicator of supply' can be developed by taking into consideration the amount, dispersion, mechanisms of supply, linguistic variety and other characteristics of the information produced of potential use to the group. These indicators can then be combined to give estimates of the need-supply ratio obtained in different groups and different fields of activity, thus allowing identification of areas of under- (and possible over-) provision.

In some cases it will be convenient to begin by identifying users of particular classes of information, in others it will be more expedient to begin with a clearly-defined group. In some cases such as 'users of environmental information' (an early candidate for study), there may be a lack of definition at both ends.

Organization and Management of information resources

Managers of information services often need assistance in allocating resources between stock provision, labour, in-house and external services. Nationally, the problems appear as decisions which must be taken about provision and distribution of a range of services, and the manpower to maintain them and to mediate between them and the user communities. At the first level, Aslib has conducted studies of standard costing, use of bibliographic records, and managerial activity of librarians. A computer simulation of a library system, which will assist solution of labour allocation problems and provide system control information for management decision, is currently under way.

At the second level, Aslib is carrying out a study of the potential utility and economic viability of computer-based networks in the UK. This study will develop models to give guidance on costs (in cash, labour, delay times and other units) and performance under different conditions of national network configurations, with some assessment of effects on other systems at all levels from international to local. Similar work related to the design of EURONET is under development.

Future work at the first level will be directed in part towards the production of a series of 'Aids to decision', a continuing series of brief guides to the solution of problems which recur in day-to-day operations. The series will cover, among other topics mentioned in the next section, applications of budgeting, demand forecasting, cost-benefit assessment, PPBS, task analysis, and other management and control techniques of potential relevance to information work. The research effort in this area will explore the applicability of modern management techniques to library, and information work, by practical test whenever possible, and will continue to develop new techniques as appropriate.

At the higher level, involvement in the design of national and international computer-based networks of information and data exchange will continue. The earlier stages of this work, drawing on the study of existing user groups and current information demand, will be largely concerned with forecasting future information requirements, which will to some extent determine the content and configuration of planned networks. Subsequent work will lead, among other things, to consideration of the changes and new features required in existing systems in order that they may profit to the maximum extent from the proposed networks. The obligation of Aslib, as representative of the information-using community, is to ensure that the operational requirements of librarians and information officers are adequately considered at the design stage of new facilities.

Following on previous work within the Department, the development of Information Analysis Centres, and future requirements for their establishment and operating conditions, will continue to be studied.

Evaluation of tools, resources and techniques

The need for evaluative studies of information tools, handling methods and resources, in order that their possibilities, limitations and performance may be clearly shown, is sufficiently obvious as not to require amplification. Studies of a range of secondary services and of the use of computerized services by interdisciplinary groups, of methods of producing indexes by computer and of some of the costs involved, and of modes of computer provision have already been undertaken. An assessment of the effects on the user of on-line search facilities is currently being conducted.

The programme of work to be pursued in this area will seek to establish quantifiable criteria for the evaluation of secondary services, both conventional and computerized, and for other tools such as reviews and specialized indexes, in order that their efficacy in various operational conditions and performance in meeting various classes of requirement may be established. Models which will be of use in guiding choice between alternative services in specific situations, and for general assessment of secondary service effectiveness, will be developed. So far as particular operational techniques are concerned, similar models, which will indicate the cost and obtainable performance of alternative means of service provision, will be designed and tested in practice. A model which applies the criteria of recall, precision and cost per pertinent reference acquired to the process of reference collection by a variety of means, including primary journal scan, is currently under consideration. Similar techniques may be developed to assess different methods of profile construction and on-line access, by users and intermediaries. The object is to provide information managers with concrete guidance in obtaining and supplying the best practicable service at the lowest cost. The costs of providing service at different levels will also be determined where possible.

Where a choice is to be made between alternative ways of providing a service, the decision-maker chooses on the basis of what he knows about the performance criteria of each, and how he values each criterion in relation to his own needs for service. This choice process is often not precisely formulated, and can be subconscious. If it is formalized, the process is seen as the manipulation of a formula or model, in which performance measures are assigned weights corresponding to value judgments and combined to give a general assessment of utility of a service in a particular situation, which can be balanced against the cost of a service. Most choice situations are effectively resolved by manipulation of an implicit model in this way. To make the process explicit requires identification of the appropriate performance criteria and assessment of the assigned weights.

In the course of this work, it will probably prove necessary to attempt to develop performance criteria supplementary to recall and precision.

Marketing
Lastly, Marketing, an omnibus term which includes education of users in the value and use of information, of managers in the need for information service support, and of the information-handling community in new techniques and research results. Marketing in the sense we are using it therefore includes education, publicity, interpretation, and persuasion. A major objective for Aslib in this area is the production of a climate of opinion, within the whole community, more favourable to the development and exploitation of information resources.

The Research and Development Department, which is and has been involved in the assessment and evaluation of some methods of user and practitioner education, will continue to carry out evaluative studies of the effectiveness of methods of instruction, direct and indirect, including short courses, the 'travelling workshop' approach, library and information service publicity material, and instructional dialogues of on-line systems. We hope that work in this area will result in material which can be adapted by information workers for the promotion and publicizing of the services they themselves produce. Some of the work in this area, then, is strictly research, in that we hope to be exploring ways in which information can be 'marketed'.

Additionally, it is considered necessary that the Department should make greater efforts to disseminate the results of its own research, so that each project results in a popular account and an informal presentation, as well as a formal research report. Where research is of interest to a group other than information specialists (*e.g.* chemists' use of data is of interest to chemists), a version of the research should be prepared for that group's consumption.

The 'Aids to Decision' series which I mentioned earlier will be one of the principal vehicles by which research results, from within Aslib and elsewhere, will be interpreted and made more easily applicable to operational situations. This series will not be devoted solely to research findings, but will include practical experience and other sorts of input contributing to more effective decision-making. It is intended that the series will be a loose-leaf, continuous collection of guides to operational practice, not a set of ready-made 'instant' decisions. Each item will deal succinctly with one specific, narrowly-defined topic, and the series as a whole will be subject to constant review and revision.

Very briefly, then, these are the main areas which we think are important, and in which we shall work. This is not to be taken to mean that we shall necessarily confine ourselves to these areas alone. Any practical research programme is a pragmatic sort of thing, and we must be always prepared for the necessity, if it arises, of responding to changes in the environment of information work, just as we must allow ourselves a certain degree of freedom to follow research topics to which we feel we can make a serious contribution.

I would end by repeating my encouragement to bring us the problems which you feel we should be working on. This section of the conference is about information resources; we are a resource, and it is up to you, members of Aslib, who first decided that such a resource should be provided, to use that resource for the improvement of your own operations and of information handling generally.

P1660

Sheffield World Metal Index: an account of its history and present state of development

Angela M. Allott

Commerce and Technology Division, Sheffield City Libraries

Paper presented at the 48th Aslib Annual Conference, Churchill College, Cambridge, 22nd–25th September 1974

Abstract

An account of the practical steps involved in building up, maintaining and exploiting a specialized collection of trade literature, standards and specifications, data compilations, and related material to produce a user-orientated service (World Metal Index WMI).

The origin and scope of the collection is outlined, together with the basic routines of updating (management responsibility, job allocation, delegation and supervision). The problems involved in co-ordinating input from manufacturers, government organizations, national standards bodies, material users and commercially published sources in many languages are covered. The organization of files, indexing rules, etc. is described. The 'spin-offs' and by-products of the WMI are indicated.

An attempt is made to answer the questions: Is the collection a successful information tool? Does it benefit the user? Finally, possible future developments are mentioned.

THE SHEFFIELD WORLD METAL INDEX is an alphabetical and numerical listing of grade names, trade names, series numbers and abbreviations. The input comes from many sources: trade catalogues, data compilations, periodical articles, and national and international standards.

Standards are made for man, not man for standards. Standardization should simplify a complex situation. That is the philosophy. The reality is somewhat different. Apart from the national and international standards there are all the other '57' varieties—company, consumer, performance, safety, military, organizational, etc. In Sheffield, the World Metal Index began in a simple way. The Science and Technology library had been a deposit library for British Standards Institution publications for many years. (A full list of all such depositories is given each year in BSI Yearbook.)[1] When the need for a guide to the grades within the ferrous standards was first recognized, the resulting index had to answer basic needs, for example, 'What standard does the prefix En appear in?' (Answer: BS. 970 (old edition).)[2] The BSI, by the way, does not issue any index to grades within its ferrous or non-ferrous standards, unlike other national standardizing bodies. One needs to know which standard to look in before one can look in it for a particular grade!

The index was made up on 5 × 3 cards, filed in cabinets. These early entries tended to give general information (such as, 'For En steels, see BS 970').

Aslib Proceedings 27 (1), January 1975, pp. 22–8. Printed in Great Britain

Later, a more thorough listing of all grades in all BS steel standards was needed, so this was done. It was quite a task. The next job was to identify the various series of standards put out by BSI (apart from its general series). BSI issues several specialist series, *e.g.* Aerospace specifications; MA (Marine standards); DD (Drafts for Development); EN standards.[3] Then it was the turn of the governmental standards, both civil and military, to be indexed, such as DEF specifications; DEF STANS; DTD; STA; PAS; BR.[4] Lastly, there were all the other British standards brought out by societies and associations. *e.g.* SMMT standards (later incorporated in BSI's AU series).[5]

Parallel to this listing of official and semi-official standards series, the index began to fill out with references to steels made by local Sheffield firms. Sheffield has long been famous for its special steels and associated industries. These local trade names were, and are, often very ingenious; they are either puns,[6] or names based on the properties of the steels, or descriptive of the uses for which they are suited.[7, 8] Information on these company names was known through the personal contact with the firms made possible by the Sheffield Interchange Organization (SINTO).[9] These same firms often presented copies of their catalogues and technical data sheets to the library. Some of these earlier catalogues are now of archival interest. Whenever grades were noticed in metallurgy textbooks and monographs, these too were indexed.[10] The input in these early days was mainly British. Prior to the 1960s, information on steel grades tended to be part of the experience of the longer serving members of the staff of the Science and Technology library; personal information rather than departmental.

From the beginning of the 1960s, however, a new stage in the development of the index began with the comprehensive noting of foreign grades and trade names. Germany was the first foreign country to be so listed, the DIN series; *e.g.* the St grades in old editions of DIN 1611, 1623. The German DNA (their national standards body) later issued very useful lists of grades within its ferrous and non-ferrous standards as special publications—*Normenheft 3*[11] and *Normenheft 4*.[12] Publications such as these left the Sheffield staff free to concentrate on checking grades which were very new (and, therefore, only appeared in journal articles) and on German company trade names. Copies of the relevant DIN specifications were obtained (in the original and in translation), and also the DNA's *Taschenbuch* series.[13] Trade catalogues of German firms were requested by special letters in German. Compilations of standards data were bought, including the justly famous *Stahlschlussel*, or *Key to steels*, and the *Stahl-Eisen-Liste*. In like manner, the standards of other countries were discovered and checked. The foreign side of the World Metal Index really 'took off' by the mid-1960s. The French standards (AFNOR) were collected, and (in all its Gallic complication and logical arrangement) a copy of the work by Maurice Pelou was bought.[14] European grades were listed in *COLIME*.[15] People asked about every kind of United States standard. Here, Erasmus J. Struglia's *Standards and specifications: information sources* (Gale Research, 1965) was a great help in tracing the various issuing bodies, as was Joan E. Hartmann's *Directory of United States standardization activities*. The plethora of American standards issuing organizations is well known. Mention must be made of ASME,[16] SAE,[17] AMS, AISI,[18] API,[19] ASTM, ANSI,[20] Federal. A set of ISO Recommmendations (later ISO Standards) was put in order.[21] Japan became of major interest.[22] MNC (Metallnormcentralen) standards were checked for Scandinavian grades and then indexed.[22] Poland became a significant market. And so on, through all the major industrial, steel-making countries. And, as each series was received, it was scanned for grades, which were then indexed and included in the World Metal Index.

By 1974, the finding of items for inclusion has been systemmatized. All the metallurgical, abstracting, engineering and standards journals are scanned regularly for new grades, new trade names, and alterations to former grades. (Articles on the purely metallurgical side—phase diagrams, corrosion resistance, shear strength, etc.—are not noted at this point. ABTICS, Alloys Index and the ASM Metals Index catch such articles. In addition, the British Steel Corporation has specialized information services more suited to this task.) Catalogues of the main standards issuing bodies are regularly 'stocktaken' for their special publications.[23] In the Sheffield Business Library, the relevant directories (both British and foreign) are combed for suitable firms to circularize.[24] Letters are then sent requesting trade catalogues[25] and data sheets.[26] The continuous updating of all the available information is a formidable task. The Science and Technology library has been put on many mailing lists, but even so, a sharp eye has to be kept on the current intake. With such a large input from such diverse sources, the co-ordination is an important job for the librarian-in-charge of the index. The rules for filing entries have to be virtually self-evident, since it is used by all the staff, both professional and non-professional, and always under conditions of pressure. Whenever possible, all the entries are channelled through a master indexer, so that consistency is maintained.

What then is the present state of the World Metal Index? It now has approximately 90,000 entries (approximately 5,000 cards are added each year). Each entry leads to the source of information on the chemical composition of the material. Some of the earliest references (and some may be over 20 years old) may refer to journals no longer held in the library. (The British Library Lending Division is a useful information source in this case.) The company's name may have changed several times since the original entry, through mergers, take-overs or nationalization. (There are still many references to trade names and steel grades of firms which are now part of the British Steel Corporation.) In addition, the firm may no longer exist, bulldozed to the ground for re-development; there is then the problem of who has taken over their trade names. Sometimes, the information in the index is not to a 'positive' composition but to a negative fact: that is, it may record that no information has been found. It may also indicate that a particular set of standards is confidential, restricted to *bona fide* suppliers or contractors.[27] The index is still basically an alphabetical and numerical arrangement of grade marks, trade names and series entries. It is not an indexer's dream. There are a few inconsistencies. The main purpose is to be helpful, to answer the questions 'Who makes what? or 'What country or organization has issued standards with these prefixes or grades?' To do this, the problems involved in asking the questions (whether by telephone, telex, letter, or in person) have to be borne in mind. For example, if a particular Swedish steel is often referred to as a 4-figure number, this must be indexed as well as the official 6-figure number, so that it will be found, whichever way it is asked for.[28] Similarly, if in the trade, it is usual to talk of British standard LG2, this must be indexed, as well as the fact it is a grade within BS 1400 LG2. Both the colloquial and official ways are listed.[29]

Sometimes, it is hard to know whether a grade is a letter or a number, when such symbols as O (letter) and I (letter) are involved:[30] these can easily be misread as o (number) and I (Roman numeral); S can be mistaken for 5 (and vice versa) by a busy person. Transliteration of cyrillic letters also leads to misunderstandings and ambiguities. There are many errors due to mishearing of letters and numbers: F for S; P for T; B for V, etc. There are, also, all those errors of transmission from the real enquirer to the one who is merely sent for the information. (Telephonists, for example, cannot be expected to appreciate the niceties of foreign standards grades.) Where all such difficulties do arise, the Sheffield World Metal Index will have a note, such as 'In this grade, O (letter) plus 1 (number) is used for the AISI tool steel'; or, that 'o (number) is now used as a prefix for a new series of British standards about standards.'[31] (The use of o (number) for a BSI series can lead to misunderstandings.)

There is still a lot of work to be done on the index. It needs extensive editing. It must be pruned for grades now more easily found in the compilations which have appeared in the last ten years (*Stahlschlussel*,[32] Ross,[33] Wellinger,[34], *Stahl-Eisen-Liste*,[35] Woldman.[35] There is no merit in the index growing bigger and bigger, if the information is readily available in another format. Duplicate entries will have to be extracted. Each entry must earn its keep. (The earlier entries to obsolete or discontinued steels will be left in, however, since information on non-current standards is often hard to find, and yet it is still much needed by repairers, scrap dealers, and even insurance companies. Incidentally, superseded copies of all standards are also filed for reference.)

In response to many enquirers, the non-ferrous grades have now been incorporated into the index. This is not because Sheffield is losing interest in steel and other ferrous materials, but because the boundaries between all kinds of metals (and even non-metals) are becoming less certain. The trend is away from talking of metallurgy towards the discussion of materials. A recent article by H. O. Howson, 'The co-ordination of steel and non-ferrous specifications' in *Metals and Materials*, May 1974, p. 271–5, puts this point very well. The index helps to indicate that a material is *not* a steel, but is, for example, an aluminium.[36] Often this fact is not known by the enquirer. There is also a trend for people to ask for the name of a product rather than the name of a steel or material. In this case, the staff check the excellent index issued by the Department of Trade, the *Patent Office. Index of World trade marks*, which is filed in the Sheffield Business library.

The routines for keeping the index useful, up-to-date and alive—a dead index is dangerous—now involve not only regular mailing and checking[38] but also the spotting of new grades for old. There seems to be a movement to re-structure the nomenclature systems used by the various steel standards bodies. In Britain, the post 1970 BS 970 has an entirely new arrangement (BSI have issued PD's explaining the new system.)[39] France has reorganized its ferrous standards. The Scandinavians have slightly altered theirs too.

The back-up collection to the index consists of data compilations, compendiums, handbooks, monographs, cross-indexes, etc. and it has now grown to more than 230 titles. This collection is always being reassessed. Books which were once stand-bys (such as the 1942 pamphlet put out by Special and Alloy Steels Committee and the Styring *Key to steel analyses* have been superseded by more comprehensive publications.[41, 42] BSI's *Worldwide list of published standards* and their new Sales Bulletin have made life easier,[43] but it is still necessary to check a wide range of journals and periodicals.[44]

As the World Metal Index has become better known, so too have the contacts with other information sources become closer. A deeper knowledge of how standards are produced and how they are arranged is now possible for the staff. Through SINTO and other information co-operatives, it is possible to 'plug in' to expert knowledge. The Technical Help to Exporters at Hemel Hempstead is now a significant contact. Many difficult problems have been solved by mutual co-operation. Overseas contacts have been particularly valuable.

What then is the verdict on the Sheffield World Metals Index and what of its future? It does the job it sets out to do. It helps to identify grades, trade names and series of standards. It is not a metallurgist's index. There are services already in existence to perform that function. It has collected much information on comparisons of metals, but 'equivalency' is a difficult concept and fraught with metallurgical dangers.[45] The index is only part of the Science and Technology Library's service to industry and the public. It takes a lot of time to maintain. But it answers a large share of all the enquiries received by the department. It is interesting to compile and it is useful to many people. There is a great deal of life in the project. It has much potential for the future. The next 5 years should see it grow in scope and content. It has come a long way from its *ad hoc* beginnings. There can be no doubt that the World Metal Index is here to stay.

REFERENCES

1 *British Standards Institution Yearbook*, 1974, p. xxi–xxiv.

2 *British Standards Specification 970*: 1955, 3rd ed. as amended. Latest edition of BS 970 is 1970–72, Pt. 1–5, plus supplements and amendments.

3 British Standards Aerospace series (formerly British Standards Aircraft series) has the following prefixes: A, B, C, E, F, G, HC, HR, J, K, L, M, N, PL, S, SP, T, TA, V, W, X.
British standards EN series (British versions of CEN specifications).
British Standards Marine series MA.
British Standards DD series (Drafts for Development).

4 DTD series (Directorate of Research Materials, Ministry of Defence).
DEF specifications, *N.B.* DEF 5000 Pt. 1 lists specifications suppliers.
DEF Standards, *N.B.* DEF STAN 99-3/1 lists 150 standards series issued by 40 different sections or departments.
STA series.
Gas Council GCIPS series.
PAS Public Authority standards.
British Rail specifications.
Home Office standards, *e.g.* HOAL: Home Office aluminium.

5 SMMT (Society of Motor Manufacturers and Traders) standards, now superseded by British Standard AU series (Automobile).

6 Examples: STAYBRITE (Firth Vickers); Kelock (Sanderson Kayser, *formerly* Kayser Ellison).

7 CUTLERY brand (Brown Bayley); Horseman high speed steel (W. A. Tyzack); MOTOR brand (Richard W. Carr); TUFCOR, case hardening steel (Jonas and Culver).

8 Park Gate (Wm. Oxley, Parkgate, Rotherham); Viaduct 15 (Arthur Balfour—their Capital works was beside the Wicker Arches).

9 Sheffield Interchange Organisation, SINTO. Founded 1932. For recent information *see* *SINTO News*; *SINTO Review of Progress* or write to: The Hon. Sec. SINTO, Central Library, Sheffield 1.

10 HOYT, S. L. *Metal data.* Reinhold, 1952.
SEABRIGHT, L. H. *Selection and hardening of tool steels.* McGraw Hill, 1950.
TSCHORN, G. *Spark atlas of steels.* Pergamon, 1963.

11 DNA (Deutscher Normenausschuss). Normenheft 3. Kurznamen und Wekstoff-nummern der Eisenwerkstoffe in *DIN-normen und Stahl-Eisen-Werkstoffblättern*). 1970, 4th ed.

12 DNA Normenheft 4. *Kurzzeichen und Werkstoffnummern für Nichteisenmetalle.* 1971.

13 DNA Taschenbuch 4. *Stahl und Eisen Gutenormen.* 1973, 23rd ed. There are 45 different 'Taschenbuchs' covering all materials.

14 PELOU, M. *Nomenclature de la technique des metaux.* 1971. Editions Science et Industrie. 6 vols, 8th ed.

15 COLIME (Comite de Liason des *i*ndustries *m*etalliques Européenes). 1954 (there is a later edition, but no really recent edition).

16 ASME (American Society of Mechanical Engineers) *Boiler and Pressure Vessel Code.* (1973 ed. plus Addenda plus ASME Case interpretations.)

17 SAE (Society of Automotive Engineers) *Handbook*: *annual.* 1974, 2 vols. (The SAE Index does not list the grades of steel etc. individually; World Metal Index indexes *each* grade *each* year.)
AMS (Aerospace Material Specifications, *formerly* Aeronautical Material Specifications). Issued by SAE. In progress (looseleaf service).

18 AISI (American Iron and Steel Institute) *Steel Products Manual.* Various parts, *e.g.* Tool steels, or Steel speciality Tubular Products. Each part is reissued periodically, in revised form.

19 API (American Petroleum Institute) Standards. *N.B.* Different divisions, *e.g.* Production Division, Refinery Division issue Standards, Recommended Practices and Bulletins.

20 ASTM (American Society for Testing and Materials). *Annual Book of Standards.* 1974 edition in 47 parts.
ANSI (American National Standards Institute). *Catalog*: (annual) shows where ANSI standard is comparable with any other standard.

21 ISO (International Organization for Standardization). Catalogue and supplements. It has issued Recommendations (the R series) and Standards ISO since 1972.

22 Japanese Standards Association. *JIS Handbook 1973*: ferrous materials and metallurgy.
MNC (Metallnormcentralen) *handbook no. 1.* 1970.

23 *e.g.* AGMA (American Gear Manufacturer's Association).
SAE (Society of Automomotive Engineers).
UL (Underwriters Laboratory)
NBS (National Bureau of Standards) US Department of Commerce.

24 *e.g.* Iron and steelworks of the World; ed. by CORDERO, H. G. 1969. (New ed. in preparation—due September 1974.)

25 *e.g.* R. G. Brown Ltd., *Stainless steel Manual*; Granges Stal. Data sheet OX 702.

26 High tensile structural steel plate, *Acieries de Champagnole*: *aciers rapides*; American Die Casting Institute. *Product standards for die casting*; British Steel Corporation. *XL CUT catalogue*; *BHP Engineering steels*, etc., etc.

27 Most company standards (as distinct from their trade catalogues or data sheets) are confidential to their *bona fide* suppliers, contractors or customers, *e.g.* Rolls Royce.

28 SIS 14 14 34. Stal Tryckkarlsstal: pressure vessel steel. *N.B.* This steel has three sub-grades, *i.e.* 14 34–05; 14 34–06; 14 34–07. In addition to the official MNC, there is the Nordic Group Steel Regulations NGS, *e.g.* NGS standard 950 lists non-standard boiler and pressure vessel steels, by Company.

29 Swedish 14 34 *see* Swedish SIS 14 14 34. Jan. 1970.

30 *AISI Steel Products Manual.* Tool steels section. Jan. 1970, p. 47.
O1
/ \
(letter) (number)
Oil hardening tool steel.

31 *British Standard* 0. *A standard for standards.*
pt. 1: 1974 Introduction to standardization.
pt. 2: 1974 The drafting of British Standards.
pt. 3: 1974 BSI Committee organization and procedures.
pt. 4: 1974 Guide to BSI editorial practice.

32 Stahlschlussel; *Key to steels.* 1974, 10th ed.

33 ROSS, R. B. *Metallic materials specification handbook*, 1972, 2nd ed.

34 WELLINGER, K. *and others. Werkstoff-Tabellen der Metalle.* 1972.

35 Verein Deutscher Eisenhuttenleute. *Stahl–Eisen–Liste 1972*, 4th ed.
WOLDMAN, N. E. *and* GIBBONS, R. C. *Engineering alloys.* Van Nostrand. 5th ed. 1973.

36 For example, British Standard BS 1474. Wrought aluminium for general purposes: HE 15.

37 Department of Industry, *Patent Office. Index of World Trade marks* (duplicated 5 × 3 slips). Subscription (to public libraries) £65 p.a.

38 Printed letters are sent in three languages (as appropriate): English, French and German.

39 British Standards Institute PD 6290. New designation system for stainless steels, 1967.
British Standards Institution PD 6423. New designation system for carbon steels, 1968.
British Standards Institution PD 6431. New designation for alloy steels, 1969.
British Steel Corporation, Special Steels Division. The revision of En steels. BS 970: the designation system, 1971.

40 Indexing of specifications to En series 970 and to the T.A.C. Schedules, 1942. Issued by Special and Alloy Steels Committee (covered government, military, railway companies, industrial and a few American steels).

41 STYRING, *Key to steel analyses.* 1961. (A handwritten listing by one of SINTO's members of his firm's grade names, and also those of his competitors and foreign rivals. There is, as far as is known, no other copy in existence.)

42 ROSS, R. B. *Metallic materials specifications handbook.* 1972, 2nd ed.
WOLDMAN, N. E. *Engineering alloys.* 1973, 5th ed.
Alloy digest is available on subscription from Engineering Alloys Digest, Inc. It acts as a supplement to WOLDMAN.
SIMONS, E. N. *Dictionary of alloys.* 1969.
SIMONS, E. N. *Dictionary of ferrous metals.* 1970.

43 British Standards Institution. *Sales Bulletin.* Five times per year (each issue is cumulative and updates the *BSI Yearbook*).
British Standards Institution. *Worldwide list of published standards.* Monthly.

44 British Standards Institution, Library. They have *reference* files of all foreign standards journals which are eqivalent to *BSI News.* The British Library, Lending Division, has *loan* copies of most standards journals. Some of the leading journals are:
ASTM Standardization News (formerly *ASTM Materials Research and Standards*); *Bulletin mensuel de la Normalisation française* (*AFNOR*); *Courrier de la Normalisation* (*AFNOR*); *DIN-Mitteilungen*; *Magazine of standards*; *NBS Technical News Bulletin*; *Normes-aciers*: *bulletin d'information techniques* issued by AFNOR, BNS (Chambre Syndicale de la Siderurgie Française) and OTUA (Office Technique pour l'Utilization de l'Acier).
Specialist technical journals also contain useful articles, *e.g.*
ROUSSEAU, P. Etat de la normalisation de produits siderurgiques en France et l'Etranger, in *Revue de Métallurgie*, Dec. 1970, p. 1037–51.
UNESCO/ISO collaborate on standards information network, in *ASTM Standardization News*, August 1974, p. 31.
HOWSON, H. O. The co-ordination of steel and non-ferrous specifications, in *Metals and Materials*, May 1974, p. 271–5.
GALLAGHER, C. G. Industrial Standards in Planned and Market Economics, in *Production Engineer*, Nov. 1973, 421–5.

45 *Metals and Ceramics Information Center newsletter*, July 1974. *Feasibility Study*: *international handbook of alloys composition.*

DISCUSSION

Session 3: Access to information—resources of the UK

MR K. VERNON (London Business School) asked Mr Richnell for the latest information about the building plans for the British Library as the stories in the newspapers were of little help in getting at the real facts of the present situation.

MR RICHNELL replied that the uncertain political situation had prevented any latest developments. He felt it would be indiscreet of him to make further comment other than to say that despite inspired guesses and comments in the newspaper, the British Library had not been asked to consider alternative sites. Plans are still, therefore, based on the Bloomsbury site.

MR P. H. DAWE (CSIRO, Australia) asked Miss Allott if computerization, publication and marketing of the World Metal Steels Index (WMSI) had been considered in view of the undoubted value of the WMSI to a wider audience.

MISS ALLOTT replied that publication of the WMSI would pose a problem and would alter its basic nature. It may be that the results of an American feasibility study of this type of problem may provide some insight into the format suitable for world-wide use.

MR D. W. BROMLEY (Sheffield City Libraries) added that some years ago Sheffield City Libraries had unsuccessfully approached OSTI and the Ministry of Technology for financial support to develop the WMSI and make it more freely available to industry beyond the boundaries of Sheffield. It was to be regretted, he felt, that OSTI had refused support because the service was a successful practical one, rather than an experimental one.

MR RICHNELL intervened to say that while he was not one to give anything away, Sheffield should perhaps try its luck again with the British Library.

MR J. S. WIDDOWSON (Technical Help to Exporters) made the point that his organization could provide specialist knowledge both on identifying materials standards and on the far more complicated work of identifying equivalents. He added that THE was seriously considering developing this work and it may be that it could justify being involved in producing a printed version of WMSI. In conclusion, he suggested that Material Information was an important international problem which could perhaps best be solved by interested organizations getting together to input information to a central source. On this point, he would be pleased to hear from any potential individual or corporate user of such information.

MR HOEY commented to Mr Martyn that it was good to have a resumé of the work of the Aslib R & D Department, and that, moreover, he welcomed the informal evening meetings which the R & D Department now holds regularly. He also welcomed the proposed introduction of a marketing and publicity programme, but wondered whether there was any possibility of some simple current awareness publication which would simply highlight Aslib R & D activities including the consultancy effort which must go hand-in-hand with the research effort.

MR MARTYN reaffirmed the R & D Department's awareness of the need for various types of publications but added that the busier the R & D Department the harder it is to find time to tell the outside world. Turning to the point about the consultancy effort, he stressed that although the immediate result of this work is the property of the client, the experience gained is shared around the department and is provocative of some research work of its own.

MR C. W. J. WILSON (AERE, Harwell) asked Mr Line to comment on three points. First, there was some evidence that long periods elapsed before material donated by other libraries was incorporated into the BLLD collection. What steps were being taken to clear the arrears? Second, it was to be hoped that overseas libraries using the BLLD photocopying service were not being subsidized by the UK taxpayer, but were paying the full economic charge for this service. Finally, while INSPEC were supposed to donate copies of certain conference proceedings to BLLD there was evidence to suggest that this was not happening, making difficulties for librarians who were asked to supply apparently non-available papers announced by a computer-based service.

MR LINE, replying to the last point first, said the short answer was he didn't know, he would look into this matter. On the question of donations, he felt that although substantial inroads into the backlog were being made it would be helpful if libraries could hold on to their donations for a while. On the final point, as the overseas libraries are paying full costs plus an overhead charge it could be said that they are slightly subsidizing the British taxpayer. Although the BLLD must lend so that it can gain full access to publications of other countries it was essentially a British and not a world-wide service. It was important, therefore, that overseas libraries didn't receive a subsidized service as this would remove their incentive to develop their own services.

MR P. W. HERON (American Library Association) expressed his appreciation of the BLLD overseas service which was a great help to the Centre for Research Libraries in its efforts to expand its activities. He wondered, however, whether publishers were apprehensive about loss of sales because of the BLLD taking one or two copies of journals which it then lends to other libraries.

MR LINE agreed that there had been some suggestions that the BLLD was damaging sales. The BLLD's reply is that the photocopying service covers a large number of serial titles which are not in financial difficulties, and furthermore, many libraries, because of limited financial resources, would not buy the titles anway.

MR L. CORBETT (Stirling University) asked whether in view of the Aslib R & D Department's problem in finding time to make available prompt information about its activities, might one expect the new Marketing Manager to supply information on *all* Aslib departments' activities. Was it possible, he continued, for the R & D department in collaboration with the BLLD, to produce a series of brief notes on the care and use characteristics of periodicals in a range of subjects? This would, he felt, be more helpful to members than some of the R & D Department work which Mr Martyn admits to having limited applicability.

MR MARTYN indicated that the Marketing Manager would have some responsibility for alerting members of Aslib activities, while Mr Line added that the BLLD had conducted a study, the results of which suggested that there was not much of a core as no journal was used more than a small number of times. He would investigate further this surprising result.

MR R. G. GRIFFEN (The Chemical Society) said that in the view of The Chemical Society its sales and potential sales had been damaged by the BLLD world-wide service to academic and industrial libraries. As the BLLD was in the position of a monopolistic supermarket with considerable powers to do irremedial damage, its prices and policies should therefore be subject to close scrutiny.

MR C. I. PEDERSON (The Institute of Physics) supported Mr Griffen's comments and added that over the past 7 or 8 years during which the BLLD photocopying activities had become increasingly aggressive, the UK circulation of journals published by The Institute of Physics had steadily declined. As a result subscription rates were higher than would otherwise have been necessary. Indeed if it had not been for buoyant overseas sales the subscription costs would be higher still. In view of the nature of this problem, it was disappointing that journal publishers have not been included in the list of interested parties who will be represented on the consultative committees of the British Library.

MR LINE replied that the situation was a complicated one affected by a number of interlinking factors of which the BLLD was only one. There was some evidence, in fact, that university libraries were devoting a higher proportion of their budgets to serials. It could be that some journals were pricing themselves out of the market, particularly as library budgets were being tightened and increased serial sales could only be at the expense of book sales.

MR H. WILMAN (IEE/INSPEC) suggested that loans, photocopying and other services were a useful way of sampling an expensive publication *before* taking out a subscription. On the question of donations to the BLLD, he would stress that INSPEC does send the more obscure conference proceedings to the BLLD.

MR P. S. HARRIS (Warren Spring Laboratory) supported the view that cancellation of journal subscriptions had in general been caused by financial pressures rather than by the BLLD photocopy services. In particular, academic journals with wide subject coverage are under the greatest pressure, because research organizations are having to do more applied than pure work in order to justify their existence. Perhaps publishers should consider splitting up the large journals.

MME MARIE CHRISTINE MARRIÉ (University of Bordeaux France), commenting on the problems of photocopying and copyright, pointed out that publishers in France had won a recent case against the CNRS (Centre National de la Recherche Scientifique) which is now allowed to give photocopies only for educational purposes and which must now pay some money to the copyright society.

MR LINE felt that because CNRS did not have a copyright declaration it had brought this situation on itself.

Choose your carpets with confidence

from DODSON BULL

UP TO 30% DISCOUNT

ALL LEADING BRANDS

Wilton ● Axminster ● Oriental ● Tufted

- All makes available with full Manufacturers' Guarantees
- Free delivery in U K.
- Expert fitting service available

£200,000 carpets on display

in our extensive London and provincial showrooms

Free brochure on request to Dept. ALB

DODSON-BULL CARPET CO. LTD.

LONDON: 5 & 6, Old Bailey, EC4M 7JD. Tel: 01-248 7971
BIRMINGHAM: 164, Edmund St., B3 2HB. Tel: (021) 236 5862
BOURNEMOUTH: 268, Old Christchurch Rd., BH1 1PH. Tel: 21248
BRIGHTON: 2-5, North Road, BN1 1YA. Tel: 66402
BRISTOL 2-3 Royal London Hse, Queen Charlotte St: BS1 4EX. Tel: 28857
EXETER: 157, Fore St., EX4 3AT. Tel: 32019
GLASGOW: 166, Howard St., G1 4HA. Tel: (041) 221 3278
LEEDS: 12, Great George St., LS1 3DW. Tel: 41451
MANCHESTER: 55-61, Lever St., M1 1DE. Tel: (061) 236 3687/8/9
NEWCASTLE-upon-TYNE: 90-92, Pilgrim St., NE1 6SG. Tel: 20321/21428
WESTCLIFF-on-SEA: 495, London Rd., SS0 9LG. Tel: Southend 46569
Open: 9.00-5.30 Mon.-Fri., Sat. 9.00-12.00 (Manchester 9.00-4.00)

BRIEF REVIEWS

CAMPBELL, M. J. Business information services: some aspects of structure, organisation and problems. Bingley, 1974. 174 pp. £3.50. (ISBN 0 85157 174 3.)

Despite acknowledgment of the fact that adequate sources of information are necessary for the business community, shortcomings still exist in the methods of providing this information. The existing sources of information available in the areas of government departments, public libraries, both national and local, institutes or associations, chambers of commerce, embassies, academic and press, both in Britain and overseas, are evaluated. Practical information on the planning, acquisition of material, publicity, staffing, extent of service and budgets of business libraries is given. Some sources of information on the more difficult areas of company details and statistics, market research, stock market transactions, the European community, earnings and cost of living are listed and evaluated.

KOCHEN, M. Integrative mechanisms in literature growth. London, Greenwood, 1974. 275 pp. £7.95. (ISBN 0 8371 6384 6.)

As the world's literature in all fields grows more rapidly every year, systems are needed which will help to reintegrate the fragmented literature, more than systems designed to gain access to the fragments. These systems are discussed in this book, which covers such subjects as: research and information science, the growth of knowledge, information science and computer aids in education, newer techniques for processing bibliographic information, information-seeking behaviour of catalogue users, integration and disintegration in the knowledge industry.

FOSKETT, D. J. *and* FOSKETT, J. London education classification: a thesaurus/classification of British educational terms. 2nd. ed. London, Institute of Education Library, 1974. £2.20. *Education Libraries Bulletin, Suppl. 6.*

The faceted London Education Classification, compiled by Douglas and Joy Foskett and used in the library of the London Institute of Education for over 10 years, has now appeared in its second edition in the form of a thesaurus/classification.

In the new edition the facets remain substantially the same, although there is much expansion in The Foundation areas of Philosophy, Psychology, Sociology and History, and there are new facets for Human Biology, Health and Hygiene and Students' Work. The order of the facets is maintained, with emphasis given to the Educand. An alternative arrangement is provided for distinguishing between facets for 'Schools' and 'Educands', if the combined facet 'Educand and Educational Institutions' is not acceptable.

The alphabetical thesaurus, which replaces the alphabetical index of the first edition, contains scope notes, broader terms (BT), narrower terms (NT) and related cross-references (RT). Unlike Thesaurofacet, it repeats BT/NT relationships already displayed in the schedules. In a fairly small thesaurus, this arrangement is quite justifiable, in view of increased user convenience.

The faceted schedules include more identation and cross-references than previously to clarify the principles of division and hierarchical relationships, and the exclusively three-letter pronounceable notation has been abandoned.

The classification/thesaurus is being used to index items in the Register of Educational Research, issued by the National Foundation for Educational Research. It also served as the British contribution to the thesaurus of the European Documentation and Information System for Education (EUDISED).

CAMBRIDGE UNIVERSITY LIBRARY, Current serials 1973; vol. 1, A–L; vol. 2, M–Z; classified list. Cambridge, University Library, 1974. 1,318 pp.; 567 pp. (classified list). £10.00 (2 volumes); £4.50 (classified list). (ISBN 0 902205 06 4.)

The main section of this publication is an alphabetical listing of titles of serials received regularly by the University Library, and by other libraries connected with the University, correct to 15th September 1973. Included in the list are newspapers, periodical reports of learned societies and research organizations, and numbered series of monographs. Though intended to cover only current serials, earlier titles of ones currently received are also included, so that the list serves as a guide to changes of titles as well as to the holdings of the Cambridge University libraries.

The layout of the main section, like the earlier (1970) edition, might confuse the newcomer to the list, but the preface explains that roman type is used for main library holdings, italic type for other libraries, and heavy type for those words which determine the alphabetical order. Round brackets indicate title changes and square brackets show other library locations. Figures in the right margin are classmarks, and in the left margin are locations for current issues. Despite this plethora of type faces, individual items are still distinguishable, and the division of the alphabetical list into two handy volumes helps to make this section easier to use.

The classified list, in a more compact volume than the previous edition, arranges the titles according to the University Library's classification scheme for periodicals, and forms a supplemental index to the main (alphabetical) list. Journals taken in departmental libraries are not included if they have not also been received in the University Library. A brief outline of the classification scheme precedes the classified list, and an alphabetical subject index follows it. The classified list gives periodical titles only; the main volumes must be used to find the location of a particular title in the University libraries.

DAVIS, M. S. *ed.* Location key to foreign language dictionaries. SASLIC (Surrey and Sussex Libraries in Co-operation), 1974. 39 pp. £1.50; £1.00 SASLIC members. (ISBN 0 903196 02 6.)

The contents of the directory are based on the results of questionnaires issued to SASLIC members. An 80 per cent response was obtained. The aim of the directory is to act as a location key for general and subject specialized foreign language dictionaries within the SASLIC scheme without supplying any bibliographical details.

The main part of the directory is arranged in four sections, each in tabular form and covering a different type of material. Section 1 covers general bilingual dictionaries in which one language is English. Section 2 is restricted to dictionaries which are subject specialized or limited by readership, *e.g.* for beginners or limited in some other way *e.g.* dictionaries of abbreviations, slang, etc. Section 3 includes general multilingual dictionaries containing two or more foreign languages and bilingual dictionaries which do not include English. Section 4 tabulates subject specialized multilingual dictionaries.

An index to the languages covered is provided. The holding libraries, which include the county, university and cooperating public, college, industrial and research association libraries in the area are listed together with their addresses and telephone numbers.

The specific subject headings used by the contributors have been retained unchanged. Entries may therefore be found under several related headings. There are no cross-references between generically related subjects; it is therefore necessary to scan the whole list of subjects to avoid missing a relevant holding. Additional entries have been used in preference to cross-references. However, the directory should prove to be a useful quick reference tool for locating dictionaries in a wide range of languages from Achumawi to Zulu within the Surrey and Sussex cooperative library scheme.

STAMPER, R. Information in business and administrative ystems. London, Batsford, 1973. 362 pp. £5.50. (ISBN 0 7134 0909 6.)

Although the title of this book refers to business and administrative systems and the preface mentions a number of professions from statisticians and accountants to computer research scientists and O.R. men, it must surely be as vitally relevant to librarians and information officers, not specifically named, but perhaps included in 'those who recognise that they must understand what their organizations do with information'.

The primary concern of the book is the use of information to solve organizational problems. To do this information specialists, 'under whatever title they are operating', need a broad ranging knowledge of information and communication processes. This book presents concepts drawn from many disciplines, including anthropology, social psychology, psycholinguistics, philosophy, measurement theory, statistics, logic, computer science, communications and control engineering and experimental psychology. The whole is organized within an analytical framework derived from four levels of knowledge: intuitive; critical; formal; empirical. Pragmatics is the operational level, where the theme is the relationships between signs and behaviour. Semantics, the business analyst's level, is the critical analysis of data, both verbal and numerical. Syntactics deals with systems of rules and the study of formal language structures, the computer programming level; empirics is the engineering level, the statistical behaviour of control systems and communication channels.

Managers, administrators, and staff specialists are all trying to make organizations use information effectively. The role of an information specialist as a critical analyst is to reveal problems caused by misuse of information and to provide solutions, technical and social as appropriate. To have a balanced view, he will need an intellectual framework that encompasses the whole range of his problems and the available approaches to solutions. A wide ranging study of the nature of information can help to provide that framework. This book gives just that: a well-written, balanced and stimulating study of human communication and the use of information and a framework to cope with the bewildering variety of concepts and disciplines involved. The practical implications are not forgotten, in giving 'a name for a set of related problems'—it is 'to help you remember to do something about them'.

MEADOWS, A. M. Communication in science. London, Butterworths, 1974. 248 pp. £6. (ISBN 0 408 70572 8.)

The unmodified broad title of this book suggests that its important and interesting subject is dealt with in a broad and comprehensive way. But the author, astronomer and historian, limits his objective to the more modest though useful practical task of compiling, organizing and summarizing all the references he can find in the widely scattered literature of his subject. In his preface he writes: 'The main purpose of this book is to draw together material from these diverse sources, forming it, as far as possible, into a coherent statement', and 'This book must be seen as no more than a brief sketch of a complex topic.'

So we have, in effect, a literature review. This documentation task has been well done. With its comprehensive bibliography the book makes a useful work of reference.

The first three historical chapters—on The Growth of Science, Competition and the Urge to Publish, and The Rise of the Scientific Journal which owe most to the author's own thought—are the most integrated and readable. But thereafter, though the accompanying 'statements' are coherent in the sense that every sentence is logically related to its predecessor, what emerges is a description of communication in modern science as a highly complex activity in which almost every firmly cited statistic—of which there are many, all faithfully recorded and interpreted—is immediately modified by the next. The reality the author is striving to describe is undoubtedly highly complex. But in the presentation of so detailed a description most readers, I imagine, would be grateful for some clearer leads through the jungle of detail. This is how a description of the heavens must have looked before astronomy gave them shape and depth.

Perhaps the main virtue of Professor Meadows' book is that it both makes plain the need and also co-ordinates the material required for a more ambitious treatment of his subject, as a contribution to information science rather than to documentation. After all, the scientific journal is one of mankind's most important inventions. The journal made it possible for little men, as well as giants, to contribute their modest offerings to man's exploration of the cosmos he inhabits—and to make modern Earth what it has become.

British Technology Index

CURRENT SUBJECT GUIDE TO BRITISH TECHNICAL JOURNALS

FOR TRACING AND RECALL

of $\left\{\begin{array}{l}\text{specific}\\ \text{recent}\end{array}\right\}$ information

in the Field of Applied Science, Engineering and Manufacturing Technology

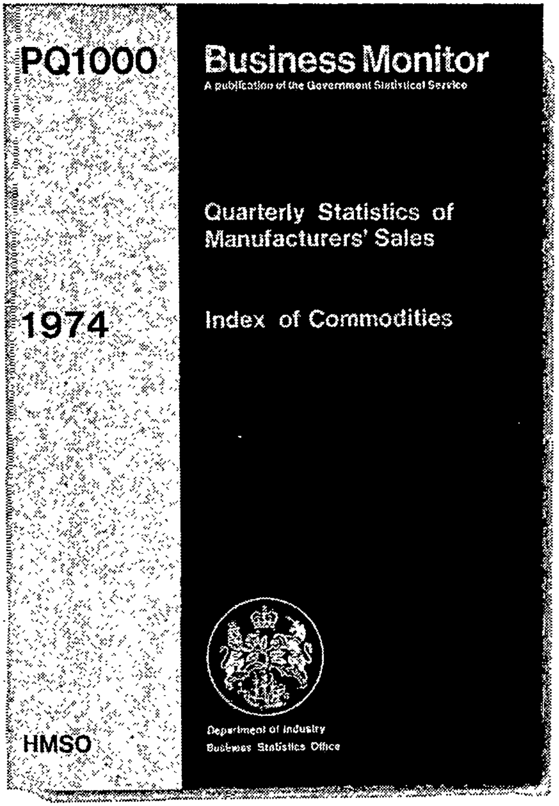
Monthly Parts and Annual Volume

THE LIBRARY ASSOCIATION

7 Ridgmount St. Store St. London, WC1 7AE
(Phone: 01-636 7543)

1 2 JUN 1975

Department of Industry. Business Statistics Office.



PQ1000

Business Monitor

A publication of the Government Statistical Service

Quarterly Statistics of Manufacturers' Sales

1974

Index of Commodities

Department of Industry
Business Statistics Office

HMSO

Now you can have an index to all those commodity sales figures you need.

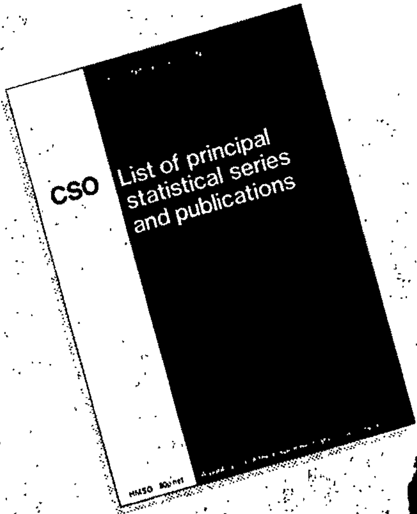
HMSO has published a very helpful Index of Commodities -Business Monitor PQ1000.

The Index makes it easy to get at figures of manufacturers sales of almost any commodity you can think of.

You look up a particular product in PQ1000 and beside it you'll find the number of the industry monitor that covers sales of that commodity.

It's quick and simple. PQ1000 is available from Government book shops, HMSO agents and through booksellers. Price 46p.

Business Monitor Index of Commodities.



An important reference book for statistics-users.

We have just published a revised edition of our *List of principal statistical series and publications.*

This gives statistics-users basic information about what's available – and where to find it.

It covers all main government statistics and also some important semi-official series.

Principal statistical series – social, economic and financial – are listed by broad subject area. Entries for each series indicate the details available, periodicity and sources of publication.

Reference is made to series where regional analyses are available.

Particular subjects can be found easily through a comprehensive index. The 275 publications in which the principal statistical series appear are listed alphabetically with price and frequency.

Central Statistical Office

List of principal statistical series and publications

Studies in Official Statistics No 20 Price 80p
Available from Her Majesty's Stationery Office

A Government Statistical Service publication

JUN 1975

Published in England by Aslib, 3 Belgrave Square, London SW1X 8PL
Printed at the Alden Press, Oxford

Aslib

Proceeding

48th ASLIB ANNUAL CONFERENCE

Session 4: ACCESS TO INFORMATION—INTERNATIONAL CO-OPERATION, FOREIGN RESOURCES

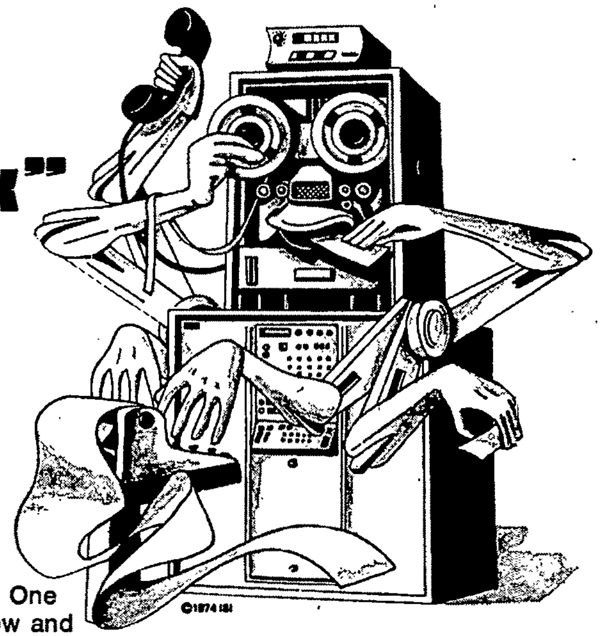
The European Connection *Raymond K. Appleyard*

Basic bibliographic control *A. H. Chaplin*

The Intermediate Lexicon *Verina Horsnell*

Access to information from the USSR and Eastern Europe *G. P. M. Walker*

FEBRUARY 1975
VOL. 27, NO. 2



every "Gimmick" should do as much as the SCI® does

Over the years librarians have handed our *Science Citation Index®* its share of knocks. Some in earnest, others in fun. One put-down we still hear now and then calls the *SCI* "an ego gimmick researchers use for counting the citations to their published papers." Only nowadays most librarians smile when they say that. Because they know what the *SCI* really is: **a comprehensive and remarkably current index to the editorial output of more than 2,700 science journals. A flexible, easy-to-use system in which scientists and librarians alike readily locate relevant information through citation, title-word, author or organization searches. In other words, quite some "gimmick".** So if you have any serious doubts about the *Science Citation Index,* maybe it's time to write us for more information. Or better yet, arrange to let some of your staff and clients discover for themselves what the *SCI* is good for besides citation counting. You can do that through a workshop conducted right on your premises by one of our information specialists. Without cost or obligation, of course. Just use the coupon to let us know you like the idea. We'll be in touch.

Please have an *ISI* information specialist contact me to arrange a *Science Citation Index* Workshop here.

Name and Title ____________________

Organization ____________________

Street ____________________

City __________ Zip ______ State/Province ______

Phone ________________ Country ______

13-412

ISI® Institute for Scientific Information
325 Chestnut Street, Philadelphia, Pa. 19106, U.S.A., Tel. (215) 923-3300, Cable: SCINFO; Telex: 84-5305
EUROPEAN CONSULTANTS
132 High Street, Uxbridge, Middlesex, U.K., Phone: Uxbridge 30085; Telex: 933693

Aslib Proceedings

VOLUME 27 FEBRUARY 1975 NUMBER 2

© 1975 Aslib and contributors

Aslib Proceedings *is published monthly and supplied free to members of Aslib. Subscription rates are £18.00 annually to non-members, or £9.00 to Aslib members requiring additional copies. Single copies £1.70, or 85p to members.*

Further information about Aslib's services and membership rates will be supplied on application to the Director, Aslib, 3 Belgrave Square, London SW1X 8PL. Tel: 01-235 5050. Telex 23667; answer-back, Aslib London.

Notes for contributors

Aslib Proceedings now accepts contributed papers in addition to those presented at Aslib meetings and conferences. They should be of a practical nature and of some relevance to problems encountered in the everyday operation of library and information units, or services. Other kinds of contribution which will be considered for inclusion are short notes on new information units or special libraries; the introduction of new techniques or systems in existing libraries where these may be of general interest; equipment designed by members for special purposes and put into operation in their own organizations; and objective reports on experience with new 'packaged' commercially available information services.

Contributions, which should be typewritten, double spaced, single-sided on A4 paper, and not more than 3,000 words in length, should be addressed to the Editor, *Aslib Proceedings*, 3 Belgrave Square, London SW1X 8PL. If possible, authors should include a summary of up to 200 words with the typescript. Authors will receive twenty-five offprints of their article free of charge.

The European Connection: international co-operation in the use of information resources

Raymond K. Appleyard

European Communities Commission

Paper presented at the 48th Aslib Annual Conference, Churchill College, Cambridge, 22nd–25th September 1974

Abstract

Some current trends, problems and principles of co-operation in the use of international information sources as seen from the viewpoint of the European Communities, together with some of the Commission's plans to: set up or improve Community information systems; develop a Community-wide network for scientific and technical information; advance the technology of information handling.

IN THE PAST DECADE, several things have happened:

1. The activity of science and technology, expressed via research and development, has come to consume an appreciable fraction of the total GNP in most advanced countries of the order of 2–3 per cent. About half of this 'investment in the future' comes from public funds. It is enough to be visible. Hence new pressures on its cost–benefit/cost–effectiveness. On the one side, *à la* Rothschild, these pressures take the form of relevance to the commissioning department (which surely includes full worldwide information on what is being done elsewhere). On the other side, the increasing complexity and interrelations of technical questions mean that full value for publicly funded research must include its optimal application to others as well—which, in the first instance, is a problem of information whether or not you also call it 'spin-off'.
2. The economic consequences of the modern technologies, both big and small in their separate ways, have become so immense and complex that judgment on the dissemination and exploitation of his work can scarcely continue to be vested in the hands of the individual scientist—and I speak as someone who spent fifteen years at the laboratory bench—particularly under conditions where patentability may be destroyed not just by written publication in a scientific journal but even by a verbal report at a conference. And this, not just in industry as hitherto, but throughout the public domain.

We clearly cannot, nor would we wish to, suppress the classical form of the scientific journals and the tradition of full and open publication, confrontation and rebuttal. But we can recognize that, over and above this fundamental element in the mechanism of natural science, much can be done to improve and

Aslib Proceedings 27 (2), February 1975, pp. 38–47. Printed in Great Britain

speed up the canalization of new knowledge toward those who may wish to exploit it: those who have, in a hallowed phrase of the European Communities, 'the need to know'.

3. The European Communities have evolved to the point where we see them today. I would remind you that they consist of nine—perhaps I should say eight and a half—countries, united respectively in:

—a Common Market
—a Coal and Steel Community
—a Nuclear Energy Community

and with the intention, expressed by various heads of governments, to go rapidly much further in the direction of making themselves into a full economic and monetary, and perhaps eventually political, union. Of these three Communities, the last two themselves conduct research and development, partly under contract, partly in their own laboratories. The product of this research belongs, in whole or in part, to the Communities. We therefore have a responsibility in certain limited areas for managing the dissemination and exploitation of information about our own research in the interests of the overall collectivity with all its variation of geography, language, custom and law.

But we are also a Common Market: that is, a single economic entity. And it is particularly this fact that imposes upon us our general principles of action. For I cannot conceive a truly effective common market in a modern technological society without fair and adequate principles and practices of access to the scientific information available within its borders. Indeed, I would go further: for a Community whose primary resource today is not a natural one like oil or wheat, but the brains of advanced science and technology, we have to be rather cautious about external access to our scientific and technical work and how we may risk giving it all away to non-friends freely or in exchange for relatively short-term benefits.

In short, if we now wave a magic wand and suppress eleven years of patient and persistent negotiation, two rebuffs and one continuing game of poker, we have a European Community—of nine countries and a good 250 million people—on the way from becoming a Common Market to becoming a real Community, a process somehow bound up with the notion of economic and monetary union, one of whose last great resources in a hostile world is their relatively advanced and homogeneous technical skills.

It is not difficult to conclude from this, together with what I have said before, that:

—the Community, just like its component states, needs a coherent policy for scientific and technical information, both towards outside countries and internally;
—the Community, if it is to be a real modern technical Community of interest, needs to ensure the widest, fastest and cheapest internal access of its 250 million market to all scientific and technical information falling within the public domain, *including* the patents literature and *beginning* with all research paid for by the public taxpayer.

I must stress here *equality of access*, embodying both pricing policies and the attack upon linguistic and other barriers, without which a fair Common Market cannot exist and *breadth and speed of access* without which the exploitation and value of scientific information (the French 'valorisation' is a very appropriate word) cannot profit from the scale of the 250 million.

It must be stressed also that the European Communities began as an economic concept intended only gradually to lead to further levels of union.

For that reason, our approach is less idealistic, perhaps more down to earth and practical than, for example, the world-wide organizations of the UN group. I can perhaps throw this difference into sharp relief by pointing to the evolution of nuclear information systems. For a good many years we ran our own in the Community, and a splendid pioneering effort my predecessor, Mr. Bree, and his colleagues made of it. Today, an agency of the UN group has organized a world-wide input. Our job almost automatically becomes to see that our members get the best possible service out of the world-wide input; the actions and approaches are complementary. World-wide input: good regional service in output seems a fine and fair combination to me, as indeed does the organization of joint regional input in certain sectors such as agriculture, in connection with the FAO's AGRIS system. We can give far more effective joint support and have far more effective joint influence than we can ever manage separately.

It is, of course, relatively easy and even platitudinous to enunciate a policy. The problem is to carry it out. This is done, on the one hand, against a certain temporal background of the state of the art and its development; on the other hand, through the creation and use of appropriate instruments, be they government departments or synchro-cyclotrons.

Let us take background first. It is easier and consists of what are, for you, at least, if not for myself as a stranger in your field, a further set of platitudes.

First, a whole set of new techniques has appeared which permit such principles to be put into practice: the computer; the modern telecommunications network; the modern copier; the tape; the microfiche. A few years ago, it was said that the cheapest way to transport information in Europe was to put it on tapes, load them into a Citroën 'deux chevaux' and drive like the devil. With the new prices of petrol and oil, maybe this is no longer true. But if it is still true (and perhaps someone here can tell me?), then it is likely to be a reflection on the pricing policies of the European as distinct from the American PTT's for data transmission.

To cut a long story short, I suppose the current trends are:

—to computer-held information interrogable in conversational mode;
—to cheaper and miniaturized hardware (but not to miniature screens!);
—to vastly improved but very expensive software, perhaps custom-designed for STI problems and not just adapted; perhaps customer adapted and accessing many data bases.

If I may suggest further, more speculative trends, these would be:

—to custom-tailor the service to a much greater degree, so as to have systems which are much more user-workable and user-satisfying;

—to move over into the supply of directly usable scientific information which includes certainly numerical or other data, the use of models, problem-solving information systems and, more generally, all analysed or otherwise intellectually treated information and not just documentation. This trend seems to me personally of particular importance in another way. Perhaps already the most significant customer for scientific and technical information is no longer the other scientific worker but the man who must take decisions beyond or outside science—political figure, public servant, industrial manager—and who needs to be very well briefed on the scientific–technical aspects of this problem as on others. He is vitally important, he is often in a hurry and the last thing he wants is a list of 200 documents, some in Russian, to which he may refer.

Nor do I think we should rest on our laurels and be satisfied that we are giving him adequate or even the right service, especially if he wants a problem-solving answer and not just a general documentation.

Against this aspect of trends, let us look at available instruments in the European Economic Communities.

The first kind of instrument we have is the regulation. We have long had, within the treaties themselves, strict regulations having force of law for nuclear information, both classified and other, arising from Community research; and these regulations are being progressively adapted to non-nuclear research. They represent the idea of Community-sponsored research as a common patrimony.

The second kind of instrument is capable people. Due to the past history of nuclear research in particular, the Commission, which is the executive of the European Community, does have small groups with specialized skills, particularly competent in:

—patent operations and studies
—publications (we have our own house journal)
—licensing and negotiations
—mechanical information systems and the associated computerology.

In addition, since 1971, Community thinking and planning has been backed by an expert committee of the Member States: the Committee for Information and Documentation in Science and Technology. This committee groups two expert representatives of each of the nine countries, usually from the interested government departments; if, on one side, it organizes co-ordination of the policies and activities of the member states, on the other it facilitates organized access to a considerable bulk of professional competence in the public services of the nine countries. At present, the United Kingdom holds the chair via Cyril Giles and is represented by Gray from DES and Nicholas from DTI.

The third kind of instrument is money or, perhaps more accurately, authority to act, including money. This we are in the process of obtaining in the European Communities. We have, in fact, completed our substantive discussion with the authorities of the member states on the broad lines of action and the associated budget and we expect, with reasonable confidence, a decision (which is a legally binding event) from the Council of Ministers before the end of the year. This decision, assuming all goes as expected, will create the first three-year Plan of Action in Scientific and Technical Information and Documentation of the European Communities.

While I dislike intensely speaking of work not yet accomplished, to say nothing of not yet even decided, it may be useful that I describe to you the history of this plan and our ideas for its development: useful in that we shall need the help of many of yourselves, as of many others and that if we make real progress, it will affect many other operations in which you are engaged.

This plan, then, had its origin in 1971 when the then six members of the EEC decided to coordinate their actions in the area to form an expert committee on the subject and finally to encourage the creation, co-ordination and rational development of scientific and technical information and documentation systems in such a way as to constitute by their association a European network, as well as to establish rules and procedures for the coherence of the network.

Now this resolution was drafted in French (English did not exist at the time) as a result of a tussle between lawyers, bureaucrats, information specialists and others of the different countries. I have given you my own very free translation but sometimes I do look at it and wonder exactly what the authors meant. And then I cheer up when I think, never mind, what matters is how we interpret it.

In any event, the Council of Ministers suffered from the general hypnotism of the idea of networking and decided to have a network; and the three new Member States accepted the idea when they joined. But the council did not define exactly what it meant by this word. Probably, as often in international circles, different people meant slightly different things and perhaps that is why we felt we had to allow two years of free and rather philosophic discussion in expert committee to follow before passing to definite proposals for action. Be that as it may, we have now come to place these under three heads:

—the development and management of certain necessary European data bases which will later be incorporated in the network as part of the Community's contribution;
—the development of the physical network itself: its software, its topology, its management, its equipment, its relations with users and suppliers of information, etc.;
—the promotion of technological progress in the area and of the education of users and specialists (in which we are separately required to engage by the same council resolution).

In each of these areas, very roughly speaking, and with substantial exceptions, we expect to begin our three-year plan with a phase of studies and end up in some sort of pilot action phase.

The principal exceptions to this level of progress lie in the first line of action where a certain number of Community information systems are well beyond the initial study phase. Notably, the European Nuclear Documentation System (ENDS), the pioneering effort to which I referred earlier and the predecessor of the INIS system of the Vienna IAEA, already contains about 1.4 million summaries. But ENDS collected its input from secondary journals. The INIS constitutes precisely a worldwide co-ordinated input carried out under the auspices of governments and directly from the primary level. So we feel we can terminate any additional input to our own scheme and devote our further efforts in the nuclear field to experimenting and promoting the best, presumably on-line use of the INIS input for retrospective research, while holding our ENDS material available as the valuable back-up it will remain for several years.

Current awareness services in the nuclear field we shall leave to national organizations, aside from looking after the interest of our own research staff.

Metallurgy is a further exception. The Council of Ministers already decided in 1971 to have a computerized Community information system in this field. If I tell you that, three years later:

—it is barely operational;
—it is still having serious teething troubles;
—it is about to be radically transformed anyway to incorporate a sensible co-operation with 'Metal Abstracts';
—several non-Community countries are already trying to join it;

the mix will probably surprise no one who is used to this kind of work. I should add that we in the European Commission do not do that much in the metallurgy system; we collect and collate the national contributions, check what we can, and combine them in a master tape which we reissue to the members for their use; and, of course, we use it ourselves.

The next sector dear to the heart of the Community is agriculture. Here also, in two respects, we are beyond the 'studies' stage. First, I must remind you that the FAO in Rome has decided to establish a 'level I' information system for agriculture, AGRIS, based on worldwide input. The Member States of the Community have decided to partition their share of this work rationally among themselves and to have a common input through what FAO calls a Main Input Centre.

Once again, then, we in the European Commission will collect, collate, check, combine the national contributions and send the integrated contribution back to all our members and forward to FAO. This scheme is in a very early pilot stage. It will, I suppose, have teething troubles. But I am seriously alarmed to observe once again that other countries, not members of the Community, already wish to join the combined European input. We shall be glad to have them, but not before there is something effectively working for them to join!

Our second agricultural system is smaller but more amusing. We are in the pilot phase of mounting a rather complete register of on-going agricultural research projects in the nine countries. The full permanent action was formally decided by the Council of Ministers this summer. To the best of my belief, very few comparable collections have been attempted or achieved before, at least at international level. The whole question of such registers in general or in many different sectors is being very actively canvassed. I think the progress and utility of our system, called AGREP, will provide a useful indicator for other projects to follow.

With the remainder of our ideas about Community sectoral information systems, I can deal more rapidly, for they are at the stage of studies. We are actively examining what might be an agricultural management information service, designed to help those who must take big or little decisions within the Common Agricultural Policy. We are examining the needs of the environmental sector, employing an unusual structure: parallel committees of information experts and of customers for information in the environmental field. Under study, *inter alia*, are:

—the feasibility of a small European information centre on anti-pollution technology;
—a referral centre for environmental information based on an inventory of sources of information compatible with what Member States will be required to contribute to the UN Environmental Programme;
—an environmental management information service;
—a joint European file of (recent) conference papers;
—joint management of the results of the various environmental monitoring systems being set up left and right;
—a European collection of information about legal aspects;
—we also have already a pilot file of chemical pollutants and assorted information about them at our ISPRA Research Centre.

We are also beginning to explore the needs and requirements at the Community level in other areas, such as the bio-medical, veterinary science, agricultural literature in so-called 'difficult' languages. We very much hope that in the science policy field, Unesco is going to mount a useful system which will save us work. We are discussing information relevant to education with the Council of Europe: we don't think ERTC is very useful to Europeans. We are most interested in helping to promote rationalization extension, co-operation of and between systems in the industrial field, especially across national borders. We would like to know if the energy sector is adequately covered in respect of scientific and technical information—always from the point of view of what is necessary for an integrated Community. We are actively discussing whether patents information is a separate effort and sector or must be incorporated in each field as we go along, with some preference for the second view.

There are so many more possible areas that I think I should confine myself to stating our principles. We will look into almost any useful idea or suggestion. But we will only act if the European Community and its principles require it and if action is required specifically at the level of the Community to ensure that its interest prevails.

Our second main line of advance is the establishment of a real communications net to carry scientific and technical information effectively and cheaply around the Community. Here, with the help of people such as John Martyn of the Aslib Research Department, we are beginning by tackling problems like, where are the users? How many and what kind of questions do they, will they ask? And commissioning studies to respond to them. Because, of course, the user market determines the scope and style of the network. Next we may ask, which data bases will participate? Which are interested? Under what conditions? Here we are ready to start talking and studying but have yet to begin seriously. Third, what structure of network, what methodology, what software, what interface equipment? As soon as the previous questions are sufficiently advanced we shall wish, with the help of the very able and enthusiastic technical aspects group of our Community Information Committee, to open studies, proposals, developments for all this and to proceed, first to pilot, later to full working of an operational scheme.

For all this we hope at an early stage to set up an expert planning group to guide and co-ordinate the studies, to help prepare specifications, monitor progress and work out timetables and overall analyses.

Some further questions underlie this obvious scheme of work. What about the commercial services and existing public services of network type offered by TYMESHARE and by ESRO-ELDO? What about advanced experiments in inter-computer communications such as the experimental high-speed data-transmission network known as COST 11 and being worked at by a group of countries not identical with the nine of the Communities?

I should say, we are at the hinge of all this. We hope to work closely with COST 11: perhaps to constitute one of the first experimental applications of whatever they develop. We are not going to compete with a commercial service like TYMESHARE: if that service is adequate and is all that people want, let them buy it. I hope we can offer a sufficiently better European service to defend ourselves; if not, we shall probably just have to stop. ESRO-ELDO uses a now rather old software in its SDS, and a similar comment applies. Moreover, this is a space organization with no real role in general scientific and technical information. But they have done most useful pioneering work: they have a rudimentary network which may well supply us with a most useful short cut. I both hope and believe we shall soon find a useful and mutually satisfying marriage of our efforts in the light of our complementary resources and objectives.

Finally, equality of access implies a reasonable degree of equality of cost. To study this horribly complex and difficult question, our Community committee has created a special Working Group. Because the problem is complicated and difficult, I cannot today see where we are heading. I don't suppose we can finally and absolutely equalize the cost of the service between those at the extremities of the Community at Bari and Aberdeen and those near the centre at Frankfurt, Paris or even Cambridge. But I believe Community principles require us absolutely to make some progress in that direction. In the meantime, our Working Group has already produced a rather useful report on the costing of services and its analysis.

A final set of problems linked to the establishment of the network remains. Both the cost and efficiency of such a decentralized network must greatly depend on the complex technical and administrative management function. We shall initiate studies of this problem from the beginning, *pari passu* with the others. And the question of adapting national or private systems to operation within the network must be carefully examined, not least in relation to the equally awkward question: in such a 'balance of advantage' situation, with a deferred yield from an initial expense, who pays and on what terms?

We are required by the basic 1971 decision of the Council of Ministers of the EEC not only to build a network and fill it with substance but to engage in the promotion of technological progress, the training of specialists and the education of users.

Very naturally, being a multilingual Community, we have a considerable and special interest in the transfer of information between languages; so we will both encourage the extension and development of reasonable and sensible initiatives in this sense and continue the linguistic researches in our own Research Centre at ISPRA. We are also interested in multilingual thesauri from the points of view of management, software and a reasonable degree of standardization. Indeed we must engage in a good deal of *ad hoc* standardization work in connection with the network.

We are also, like everyone else, of course, interested in all the various schemes and approaches to automatic indexing and retrieval (our ISPRA Centre works on these as well). For myself, I would like to go a good deal further and look into schemes which really treat the customer as king and perhaps try to remember his wishes, habits and idiosyncrasies for the next time.

In respect of the training of specialists, unless anyone can convince me that another approach is better, we shall probably begin with the well-tried formulae of sponsoring summer schools, discussion groups, seminars and workshops, and perhaps short-term inter-institute visits to learn specific techniques, although I am not certain whether these last are as applicable here as in the basic sciences. If others want to proceed to compare diplomas and definitions of librarians, documentalists and information scientists, we will be happy to help, but the road is stonier and the outcome less rapid and direct.

In respect of education of users, we could all do a bit more. Every university graduate—certainly every scientist—ought today to know what a computerized information system is and should have used one in practice. And industry itself could profit from far more on-the-spot practical demonstrations of these things than have been arranged. I confess I don't quite know how to help here. Would mobile demonstration units on the lines of that planned by the British Library be useful on the industrial front? I hope for some initiatives from our Working Group on this subject, but has anyone else some notions that might help me?

You will, no doubt, have noticed that my ideas have got vaguer and vaguer as I have progressed down the long line of subjects we must attack. Of course, any programme is like that: the first things, you are already doing; the last are only glimpses on the horizon. So perhaps the middle-term are the most significant for me to summarize. Over the next few years, I and my colleagues at the EEC will, I hope,

- —ensure the setting up and management of the European scientific information system EURONET, on a comparable scale with the big American systems;
- —work out and propose to the Member States a Community policy putting scientific and technical information at the service of the public authorities, of industry, of research and education and guaranteeing fair and equal access to the various social groups and individuals of the Community;
- —in the longer run, watch over scientific and technical information as a

> precious European and Community resource, especially in the so-called 'post-industrial' society to which we are coming and especially for a Europe relatively poor in physical and chemical resources and as a decisive factor in the elaboration of economic policies, in the orientation of policies for science and technology and in guiding the evolution of society.

With these problems, and with the co-operation of colleagues such as yourselves, we will do our best.

That said, what I most sincerely hope will not be vague in your minds is that the European Communities and their principles and economic coherence require a coherent policy for science and technology and its exploitation, that this can only hinge upon an effective handling of scientific and technical information and that we intend now to act to ensure this, to the benefit of our whole Community of peoples.

Aslib Occasional Publication No. 15

Short course assessment and evaluation in the library/information field

Margaret Slater

£5.00; £4.00 Aslib members
SBN 85142 063 X

3 Belgrave Square SW1X 8PL

Aslib Publications

Basic bibliographic control: plans for a world system

A. H. Chaplin

IFLA Committee on Cataloguing

Paper presented at the 48th Aslib Annual Conference, Churchill College, Cambridge, 22nd–25th September 1974

Abstract

A necessary foundation of library and information services is knowledge of what documentary material exists. Since no field of knowledge and no geographical area can generate within itself all the information it needs, a complete and universal record is required. While the creation of such a record at a single centre is a utopian ideal, improvements in national records and in techniques of international communication have made a worldwide co-operative system a realistic goal. Under the title 'Universal Bibliographic Control' (UBC), IFLA—working in association with Unesco and other bodies—is establishing a programme to promote an international network of bibliographic agencies. Problems to be solved are: on the national level, complete coverage of national output and speed of production of the record; on the international level, standardization of formats and the creation of co-ordinating machinery. The UBC programme is complementary to that of UNISIST: a future integrated bibliographic and information system might be based on two interrelated categories of records—national records of separate publications, unrestricted in subject-matter, and international records of contributions to knowledge (whether separate publications or not), limited to particular subject fields.

THE MAIN FOCUS of Aslib's attention, as I understand it, lies in the organization and improvement of specialized information services. My present subject—the provision of a general record of available publications, regardless of their origin, language, form or content—may seem rather remote from this central interest, but is not, I think, irrelevant to it. It may be compared to one of those general services—the railway, the post office or the electricity supply—which are not thought of as part of the business of the providers of special services, but nevertheless enter into all their operations.

Providers of specialized information naturally rely largely on specialized sources: abstracting services, journals and bibliographies relating to the disciplines in which their own major interests lie. But these sources must themselves select their material from wider, less-specialized sources. Not all the material contributing to a particular discipline is to be found in the literature created by and for its own practitioners: it must be sought over a much wider field. Then again, the special information relevant to some form of practical activity may be multidisciplinary in character, drawing on sources serving many different specialities, and even the most insignificant publications, by their very existence,

Aslib Proceedings 27 (2), February 1975, pp. 48–56. Printed in Great Britain

provide material for sociological research. The theme chosen for this morning's session also emphasizes the need to draw information not only from the literature of our own country but from that of all other countries.

Thus the transfer of any particular piece of specialized information may be seen as the apex of a pyramid made up of layers of information sources of different degrees of specialization, each resting on one wider and less specialized. Ultimately, the necessary foundation of the whole structure is an awareness of the total set of information-bearing material available.

Vehicles of information may, of course, be of many kinds, ranging from the human voice through the private letter, the manuscript circulated to a group, the duplicated document, to the printed paper or book, not to mention newer media developed by modern technology. Of these, the one I am now primarily concerned with is the product of the printing press, particularly in the form in which it is not directed to a limited circle and therefore accessible to specialist users through special channels, but is made available through a public distribution process to the world at large—in a word, with publications.

Bibliographic control—by which we mean an organized and accessible record of what published material exists—has long been an ideal pursued by scholars and librarians. Several distinct lines of activity have been followed: the recording of publishing output on a national basis and the collection of information on the literature of particular subjects are two of them. A third, which is also of considerable importance, is the recording in catalogues of the contents of large libraries. The pursuit of these lines of activity has resulted in a vast mass of heterogeneous bibliographical publications, through which it has been an important part of the librarian's trade to find his way and to guide enquirers.

The idea of a world centre at which copies of all these bibliographical records would be collected and co-ordinated, and from which bibliographical information on any subject could be distributed, lay behind the foundation in 1895, by Otlet and La Fontaine, of the Institut International de Bibliographie at Brussels. But the vast and accelerating expansion of published information that set in about that time rendered this ideal impracticable, and the successor to the Institut, the Fédération Internationale de Documentation, has become an organization not for the direct control of bibliographical information but for the study of methods of exploiting it—an activity in which Aslib plays a prominent part.

In fact, the idea of a total bibliographical record, accessible to the world as a whole, lay dormant for half a century, except so far as it was pursued, subject to limitations determined by the extent of their resources, by a small number of large national libraries. It was indeed one of these, the Library of Congress, which ultimately, in the 1960s, once more breathed life into the idea.

The National Program for Acquisitions and Cataloging, launched by the Library of Congress in 1965,[1] was inspired by two purposes: first to provide for the academic community of the United States access to the products of world culture, the output of all the significant centres of publication throughout the world, and secondly, to avoid the expensive and wasteful duplication of effort involved in the separate cataloguing by each of several hundred large libraries of its own selection from this comprehensive collection of literature. The idea was that the Library of Congress should collect and catalogue all the publications issued anywhere in the world that were 'of value to scholarship', and distribute the resulting catalogue entries to American libraries. This enterprise accepted the existing mass of bibliographical material as something that was *there* and with which the library community must continue to cope, and concentrated its effort on capturing and recording, as near as possible to their origin, new publications as they appeared. This programme, aimed at economizing in the use of resources by American libraries as a whole, was so vast that it had to be conducted also with regard for economy in the expenditure of the Library's own resources. Just as cataloguing by many libraries was to be avoided by cataloguing once for all by the Library of Congress, so the Library of Congress itself wished to avoid the complete re-cataloguing of material that had already been adequately described somewhere else. This led to a careful examination of the entries published in a number of national bibliographies and to the important conclusion that nearly all of them gave, with slight but acceptable variations, the descriptive information required for Library of Congress cards. The result was what became known as the Shared Cataloguing Programme. The Library of Congress set up a number of acquisition agencies in different countries, from which it received, with each batch of publications, copies of the corresponding entries in the local national bibliography, procured in proof before publication. These entries, with the appropriate Library of Congress headings added, could then be supplied to American libraries, often before the publications themselves had reached them.

Several of the acquisition agencies were set up in areas where national bibliographies were non-existent or far from satisfactory. Here, the publications acquired for the Library were catalogued on the spot by staff specially trained for the purpose, and the resulting accessions lists constituted partial substitutes for a national bibliography, which were often of great value within the country itself.

Herman Liebaers, the president of IFLA, has recorded that, when this programme was described at the IFLA General Council meeting at the Hague in 1966, Carlos Victor Penna, a Unesco official who was present, exclaimed: 'but this is universal bibliographic control!'[2] And it is under this name that IFLA has taken up and pursued the Library of Congress's objective on a wider international scale. IFLA, as a very widely representative international organization, saw that although the Library of Congress was prepared to make the results of its programme available to libraries in other countries, this could not be satisfactory as a universal scheme. The programme contained an element of selection, based on the outlook and interests of American academic libraries and, in any case, the librarians of the rest of the world could not be content to accept passively a system which had its origin and its direction entirely in one country.

IFLA's programme for universal bibliographic control (now generally referred to as UBC) has two main elements: it recognizes that each country should be responsible for producing its own section of the universal record, and it is based on the recording once for all of each publication as it appears.

The first element involves the adoption of the concept, developed by Unesco, of the national bibliographic centre, an institution which will not only record the national output of publications but will also receive and distribute within its own country bibliographical information from the rest of the world. The second element involves the concept of national records that will be interchangeable. If each national record is to be capable of being used with little or no modification in catalogues and bibliographies created in other countries, then all must conform to certain agreed standards.

The policy is conveniently summarized in the following resolution, adopted at a meeting organized by the IFLA Committee on Cataloguing and approved by the IFLA General Council at Copenhagen in 1969:

> Efforts should be directed towards creating a system for the international exchange of information by which the standard bibliographical description of each publication would be established and distributed by a national agency in the country of origin of the publication. The means of distribution in such a system would be through the medium of cards or machine readable records. The effectiveness of the system will be dependent upon the maximum standardization of the form and content of the bibliographical description.[3]

The reference to machine readable records is important: a decisive factor in the crystallization of the UBC policy was the rapid growth of the use of computers in bibliographical work. At the time of the 1969 meeting several important national bibliographies had adopted computer production and others were preparing to do so. The MARC format had been developed co-operatively by the Library of Congress and the British National Bibliography, and the exchange between them of bibliographical data on MARC tapes was an immediate prospect. The extension of such exchanges in the near future to cover all the major publishing centres, at least in countries using the roman alphabet, was clearly a possibility. This situation not only offered the prospect of a widespread international exchange system: it made the compatibility of national systems a matter of urgency.

The president's call to make UBC a major objective of IFLA policy was received with enthusiasm in the federation generally, and particularly in its specialist committees on cataloguing, bibliography and mechanization; and UBC was made the general theme of the IFLA General Council meeting at Grenoble in August 1973.

The implementation of the policy requires action at two levels: the national and the international. In both areas IFLA sees itself not as the sole executant of the policy, but rather in a planning and co-ordinating role, and hopes to secure the co-operation of national governments and national bibliographical institutions as well as of other international bodies—in the first place of Unesco, but also of FID, the International Standards Organization and others.

The functions to be performed at the national level are primarily the collection and recording of information about new publications issued within the national territory. For the purpose of providing the kind of standard authoritative record required by an international system, the mere reporting of new publications by their publishers is not sufficient. Copies of the publications themselves must be procured by the recording agency.

The generally accepted method of procurement is legal deposit—the obligatory supply of one or several copies of each new publication to a national centre. A few voluntary systems, dependent for their effectiveness on a well-organized and co-operative publishing industry, still exist, but several—for instance in Belgium and the German Federal Republic—have in recent years been replaced by legal deposit, and others—for instance in the Netherlands—are expected soon to go the same way. There are, however, wide variations between the legal deposit systems of one country and another: differences in the definition of what has to be deposited—newspapers, government publications, university theses are included in some countries and not in others. A few deposit laws, but only a minority, cover such information-bearing media as films and sound-recordings. There are variations in the matter of who is required to make the deposit: publisher, printer or author. Delays allowed by the law between publication and deposit, varying from a month to a year or more, create difficulties in using legal deposit as the basis for an up-to-date current national bibliography. Enforcement of the law is also a problem, which may become almost insuperable in countries where individual authors are commonly their own publishers, as is the case, for instance, in parts of Latin America. IFLA hopes in the near future to be associated with Unesco in formulating standards for the coverage and operation of legal deposit systems.

Once the material is collected, the record of each publication must be made and published promptly, and must conform to international standards. This requires the existence of a bibliographical centre with adequate trained staff and adequate financial resources—conditions not always easy to satisfy. This centre will normally be part of a national library, in which the deposited material will be preserved and where the operation of describing new publications in the national bibliography can be combined with that of cataloguing them for the library.

In countries with a small publishing output, regular publication of a bibliography at frequent intervals may be impracticable. The possibility of co-operation by several such countries in the production of a regional bibliography is being investigated in several parts of the world.

The primary task at the international level is the elaboration of standards for the content and form of national bibliographical records. First, standards for the content. What data must be included to identify each item adequately, and to provide such further information as is essential for the uses to which it is expected that the record will be put? Second, form. Which parts of the record should consist of direct transcription from the publication, and which should be presented in a conventional form? In what order should the data be presented? By what form of name is an author or a sponsoring body to be identified? How is the subject content of the publication or the relation of its content to that of other publications to be indicated? Finally, standards for the physical medium of communication. These may range from standard dimensions and layout for catalogue cards to standard formats for machine-readable records.

The framing of these standards and the encouragement of needed improvements at the national level constitute a formidable programme of action, which requires some form of central organization. The time has come when such an organization can be created, thanks largely to the material assistance of the Council on Library Resources in Washington, which has for almost twenty years taken a benevolent interest in IFLA's efforts to achieve international uniformity in cataloguing and bibliographical practices.

IFLA has appointed a small steering committee to administer the funds and to give general direction to the programme. Its membership is drawn from Europe, America and the Third World, and its chairman is Mr Rutherford D. Rogers, Librarian of Yale University. The Steering Committee is assisted by an Advisory Committee to which not only the committees and sections of IFLA with a large interest in UBC but also other interested organizations—Unesco, FID, ISO and organizations associated with the UNISIST project—have been invited to appoint representatives. A permanent office—the International Office for UBC—has been established in London and will be directed by Mrs Dorothy Anderson, until recently Executive Secretary of the IFLA Committee on Cataloguing. In addition to the support received from the Council on Library Resources, the General Conference of Unesco will later this year be considering a proposal to allocate a considerable sum, comparable to that already voted for UNISIST, to the UBC programme, and several important national organizations have already made or promised contributions. The British Library, as its contribution, is providing premises for the UBC Office. The first joint meeting of the Steering Committee and the Advisory Committee has just been held in London, and an outline initial programme has been drawn up.

This programme does not, of course, involve starting from scratch with all the activities that have been mentioned. A great deal of work has already been done, much of it before the formulation of the UBC programme under that name. Ever since its foundation IFLA has cherished the ideal of uniformity in cataloguing rules for libraries, and much of its recent work on the standardization of bibliographical records is a development from the conclusions of the International Conference on Cataloguing Principles organized by IFLA in 1961. What is new is the recognition of the national bibliographical record as the authoritative source of the data in catalogue entries. Hence the inclusion of national bibliographies as well as library catalogues within the scope of IFLA's activity.

In the last three years the Committee on Cataloguing has enjoyed the services of a full-time secretariat (this also supported by the Council on Library Resources). During this period the Committee has been able to produce the International Standard Bibliographic Description for Monographs—ISBD(M)[4]—and, in association with the IFLA Committee on Serials, a companion document, the International Standard Bibliographic Description for Serials—ISBD(S)—at present circulating in a provisional form.[5] Both these documents specify the elements to be included in the descriptive part of the bibliographical record, assign a fixed order to these elements and distinguish elements with different functions by means of a prescribed system of punctuation, which not only assists in the interpretation of records in an unfamiliar language but also facilitates the conversion of the records into machine-readable form.

Jointly with the Committee on Mechanization, the Committee on Cataloguing has set up a Working Group on Content Designators for machine-readable records, and is co-operating with ISO in working out principles for filing. Under contracts with Unesco it has also initiated studies on the description of non-book materials, on cataloguing in publication as a means of speeding up the production of a bibliographic description, and on the possibility of adding to the standard description symbols indicating the function or intellectual level of a publication. With regard to the production and publication of national bibliographical records, the IFLA Committee on Bibliography has collected, with the assistance of Unesco, a considerable body of information as a basis for working out standards for the content, frequency and form of publication of national bibliographies. New items in the current programme are proposals for meetings of representatives of mechanized bibliographical systems, for a conference of national bibliographies in general, whether mechanized or not, and for regional meetings or seminars of an educational nature, to assist in the application of the new standard procedures. A large and difficult question, on which work has still to be undertaken, is that of finding an internationally acceptable code for indicating in national bibliographies the subject content of the publications described.

In the execution of the programme, the UBC office will act as a centre of liaison and co-ordination between the various sections of IFLA and between IFLA itself and other interested organizations. It will provide secretarial and editorial services to the committees and working groups carrying out specific projects, organize or help to organize conferences and seminars, and recruit research workers and consultants.

The UBC programme is an ambitious one, and progress with its implementation will be gradual, but can be expected to be real and continuous. The early prospects are for a fairly rapid extension of the use by national bibliographies of standard formats for their records, and of interchange of information through machine systems by the more advanced bibliographic centres. Rather more remote prospects are the inclusion in the system of a growing variety of information-bearing materials other than printed documents, and the gradual spread of mechanized national centres for the local distribution of data derived from the international system. There seems to be no reason why most of us here should not live to see a virtually worldwide system of mechanized exchange of bibliographical information.

It will not have escaped your notice that two very important elements in a complete system of bibliographical control have been omitted from what I have said so far. The first of these is retrospective national bibliography. I have referred to the vast mass of existing bibliographical publications, which includes compilations of a national character extending back over long periods of time, and the catalogues of the large national libraries which contain a substantial proportion of the published literature of their own countries. But I know of no country that so far has produced a complete and satisfactory retrospective national bibliography. It is to be expected that, as circumstances and resources permit, national bibliographic centres associated with national libraries will undertake the task of compiling retrospective bibliographies. But this problem lies outside what I have thought it possible to consider today.

The other omission is one of considerable importance to an audience of documentalists and special librarians. This is the bibliographic control of the content of publications that are not monographic in character. The system I have described is conceived as including the record of serial publications as such, but not of the individual contributions they contain. The reason for this is that here we enter the realm of the specialist. We have to rely on national institutions for our basic bibliographical record because it is only on a geographical basis that it is possible to discover what is actually published. Without this knowledge the specialist cannot begin his task of discovering within the publications the items that are of interest to him.

The specialist is interested in locating all the information relevant to his subject, without reference to its geographical origin or, in general, to the language in which it is written. There already exists a large number of publications and services providing international bibliographies of contributions in specialized fields, and Unesco has already sponsored, under the name of UNISIST, an international project designed to foster and co-ordinate their work. IFLA has no intention of attempting to supersede or to take over these activities. The two concepts, UNISIST and UBC, are complementary, not competitive. They are in fact inevitably closely interrelated: this is shown by the case of the ISDS—the International Serials Data System. This project, initiated as part of the UNISIST programme, is designed to help the mechanized exchange of information about articles in periodicals by giving to each periodical an identifying number. For this purpose a world register of serial publications, each identified by a standard set of bibliographical data, is to be created at a single centre. This centre has been established in a national library—the Bibliothèque Nationale in Paris; and the fundamental principle of UBC—the national centre as the source of bibliographical data—has been recognized by the decision to obtain the required data for the serials issued in each country from a national centre. I need hardly add that the national centres so far designated are in national libraries which are also responsible for producing national bibliographies. In fact, the information required by the ISDS is part of the information that must be collected by a national centre for the purpose of UBC.

If UNISIST, the organization of specialized bibliographical information on an international basis, is fully to achieve its aim, it must rest on the foundation of UBC, the recording of general bibliographical information on a national basis. It is in the combination of these two forms of organization that we may see the world bibliographic system of the future. There may be an augury of this in the fact that at this moment there is in progress in Paris a Unesco Intergovernmental Conference on the Planning of National Documentation, Library and Archives Infrastructures. Documentation and libraries are being considered there as parts of a single theme, and this gives encouragement to the supporters of the suggestion that scientific information and libraries should in future be brought within the scope of a single Unesco division, not divided as at present between two. IFLA has presented to this conference a paper by Dorothy Anderson, describing much more fully than I have been able to do here the UBC programme, and emphasizing the international dimension of national bibliographical organization.[2] From this situation we in IFLA hope will emerge more effective support, both national and international, for a policy now revived in more favourable circumstances but clearly defined sixty-six years ago by those far-sighted pioneers, Otlet and La Fontaine, from whose 1908 report on the state of international bibliographic organization I end by quoting

> 'Each country should compile the inventory of what appears within its borders. . . . The principle of specialization in bibliography then requires that, once the basic inventory has been made, specialized international organizations should assume the responsibility of compiling the bibliography of particular sciences.'[6]

REFERENCES

1 CRONIN, J. W. The Library of Congress national program for acquisitions and cataloging. *Libri*, 16, (2), 1966, p. 115.

2 ANDERSON, DOROTHY. *Universal bibliographic control: a long term policy, a plan for action.* Pullach bei München, Verlag Dokumentation, 1974.

3 Report of the International Meeting of Cataloguing Experts, Copenhagen 1969. *Libri*, **20**, (1), 1970, p. 113.

4 *ISBD (M): International Standard Bibliographic Description for monographic publications.* 1st standard ed. London, IFLA Committee on Cataloguing, 1974.

5 *ISBD (S): International Standard Bibliographic Description for serials.* Recommended by the Joint Working Group . . . set up by the IFLA Committees on Cataloguing and on Serial Publications. London, IFLA Committee on Cataloguing, 1974.

6 LA FONTAINE, H. *and* OTLET, P. L'état actuel des questions bibliographiques et l'organisation internationale de la documentation. Bruxelles, 1908. (*IVe Conférence internationale de bibliographie et de documentation. Document no.* 6.) p. 25.

In-Training in Information and Special Library Units

Elizabeth Mack BSc, FLA, MI Inf Sci

In-training is defined as training given or received with direct relevance to and during employment; it is taken here to include induction training, post professional-education training, and traineeship

£2.50; £2.00 Aslib members

SBN 85142 062 1

3 Belgrave Square London SW1X 8PL

Aslib Publications

The Intermediate Lexicon: an aid to international co-operation

Verina Horsnell

School of Librarianship, Polytechnic of North London

Paper presented at the 48th Aslib Annual Conference, Churchill College, Cambridge, 22nd–25th September 1974

Abstract

This approach to co-operation between libraries and information centres considers the use of switching languages. These can be employed in situations where several centres with a common interest wish to co-operate in the collection and indexing of information bearing material, yet prefer to retain the systems often developed and tailored to their individual requirements.

To facilitate the exchange of subject information between the centres, a series of concordances are constructed between each of the indexing languages and the switching language. Thus the translation of subject indexing expressed in the indexing languages of the other participating centres can then proceed automatically.

Among the possible benefits are the economic saving due to the sharing by several centres in the collection and indexing of material, and the increase in coverage enjoyed by all the centres. To determine the feasibility of such devices, a switching language, the Intermediate Lexicon for Information Science, has been developed and is under test at the Polytechnic of North London School of Librarianship. The work is supported by a grant from British Library Research and Development Department.

Introduction

IT IS PROBABLY TRUE to say that for any given specialist field, take for example biomedical engineering, or computing, or information science, that there is at least one, if not more, literature collection held in this country, and the same would be true for many other countries. That there are benefits to be derived from co-operation between information centres and special libraries with similar interests is demonstrated by the many exchange networks operating at both national and international levels which are already in existence. One major benefit in many cases is the possibility of drawing upon a much larger store of documentary material than it would be possible for a single centre to acquire and process.

When a group of information centres agree that it would be mutually beneficial to form a co-operative network, allowing each participant access to the other data bases, they are faced with a decision as to how this network can best be implemented. There are several possible courses of action, for example:

(1) an exchange of indexes to the document collections held at each centre. However, this unfortunately may not be as straightforward as it sounds.

Aslib Proceedings 27 (2), February 1975, pp. 57–66. Printed in Great Britain

(a) Not every centre may hold its indexes in a form capable of duplication and distribution, *e.g.* if the index is held on feature cards.
(b) The natural language in use at the participating centres may not be the same, so it is necessary to decide whether or not to translate the indexes.
(c) There is likely to be a time lag between the acquisition and indexing of a document at a given centre, and the subsequent production of indexes in a form suitable for distribution to the other centres.

(2) A second approach to co-operation is standardization, whereby each centre agrees to use the same indexing system and hence material can be exchanged in a compatible form.

Again there could be a problem here. It is likely that each centre, having been in existence for some time, would have developed a retrieval system designed for local conditions taking into account such things as financial resources, staffing, user requirements, etc. To standardize therefore may well result in some conflict of interests, and financial expenditure if a new system is to be implemented.

(3) A third alternative is to employ a method whereby the existing indexing systems at each of the co-operating centres can be compatible.
(a) One method is that of thesaurus reconciliation which has been investigated by Dr. H. H. Neville of the Building Research Station.[1] Here terms from each of several independent thesauri are reconciled resulting in a master list or source thesaurus.
(b) Another approach is the use of switching languages,[2] in particular the Intermediate Lexicon. This was originally developed by an International Working Party convened by the Groupe d'Etude sur l'Information Scientifique, in Marseille, and lead by M. Gardin. A current study of the feasibility of switching languages is being undertaken at the School of Librarianship of the Polytechnic of North London, supported by a grant from the British Library Research and Development Department.

Intermediate Lexicon Concept

The Intermediate Lexicon is a device which will allow the translation of indexing terms from one indexing scheme into another (figure 1). The procedure is as follows. Assume each rectangle in figure 1 represents an indexing scheme in use at each of five centres. A document received at centre D is indexed using the local indexing scheme Sd. This results in a set of indexing terms assigned to that document Td. This set of indexing terms Td is translated, or switched using a concordance or equivalence table indicated by the arrows into a set of entries T_{IL} from the Intermediate Lexicon IL. This set of entries can be translated via the appropriate equivalence table into terms from schemes used at the other participating centres. For example, set of indexing terms Ta from indexing scheme Sa at centre A, Tb from Sb at centre B, Tc from Sc at centre C.

Desiderata of the Intermediate Lexicon

An Intermediate Lexicon is required to switch effectively into and out of a number of different indexing schemes which will exhibit a variety of features. These schemes may be in the form of faceted or enumerative classifications, thesauri or alphabetical keyword lists, or there may be no control over the indexing vocabulary as, for example, some KWIC or KWOC indexes. The scope or coverage, and vocabulary size may vary with each scheme as may the relative specificity of the terms. The indexing mode employed may be pre- or post-co-ordinate, and the policy on indexing depth or exhaustivity is unlikely to be the same from centre to centre. Other factors which may have to be considered include the use of term co-ordination, synthesis, truncation, links, roles, etc.

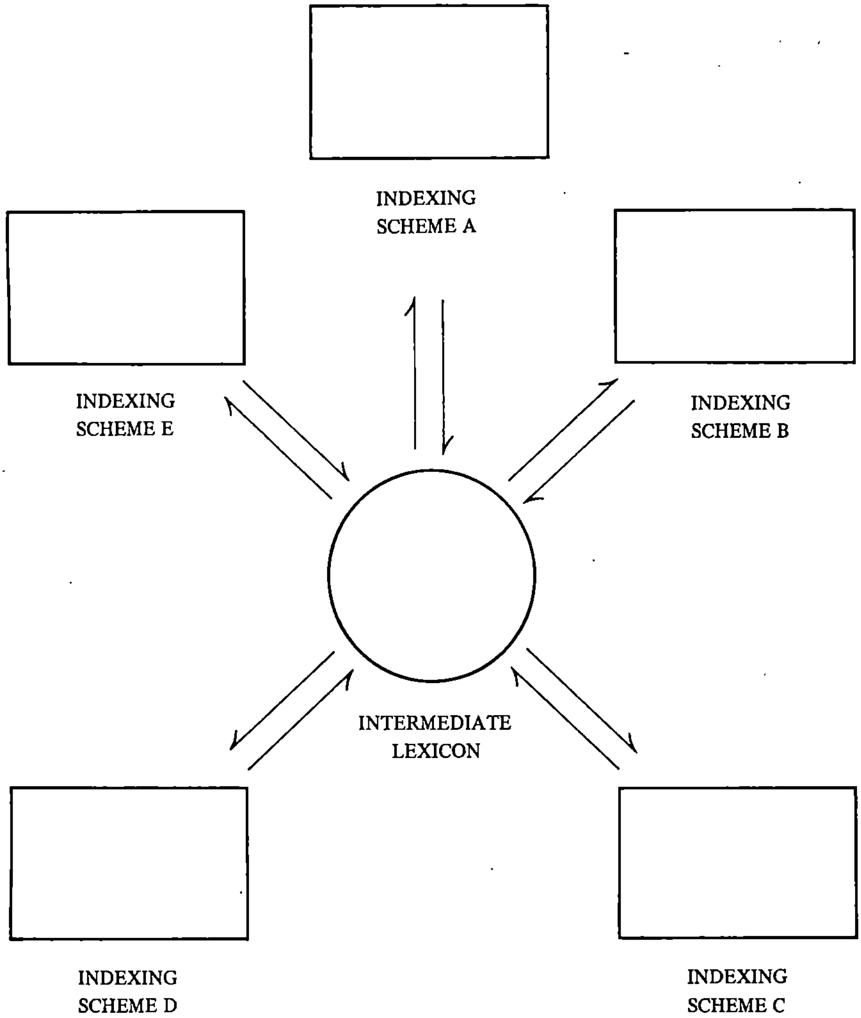


FIGURE 1

This would indicate that in the construction of an Intermediate Lexicon the following factors should be considered. The structure should be flexible enough to allow addition of new concepts, and some means of sufficiently or unambiguously defining concepts should be provided. The coverage of the Intermediate Lexicon should be broad enough to include all topics covered in the schemes with which it is to be used, and the specificity of the concepts comparable with that found in the schemes. If the Intermediate Lexicon is to be a reasonable working tool this seems to indicate that a limit should be imposed on the size of vocabulary and in this case the use of synthesis would allow the flexibility to be realized.

Structure of the Intermediate Lexicon

The area covered by the present Intermediate Lexicon is Library and Information Science.[3] The structure chosen was that of a faceted classification. Concepts are organized into broad facets from general to specific and organized into arrays within each facet according to a pre-arranged formula.

- Library and Information Science (LIS)
  - Context
- Non-LIS
  - Fringe Disciplines
- General Terms
- General Activities
- General Operations
- Administration
- Artefacts
- Persons
- Organizations
- Information
- Documents (broadly)
- Documentary Materials (general)
  - Booktrade (production and distribution)
- Documentary Materials (LIS context)
- Technical Operations
  - (product)
    - Catalogues/Indexes
  - (kinds)
    - Cataloguing
    - Descriptive Cataloguing
    - Subject Indexing

and within the facets according to the following pattern:

- Context
  - Relations
- Structure and Characteristics
- Characteristics (properties broadly)
  - Physical

- Characteristics (properties broadly) (*Cont.*)
  - Non-Physical
    - Organizational
    - Intellectual
  - Form
  - Content
  - Self Activities (Processes)
- Elements. Parts
  - (As Characteristics)
- Materials (Matter)
- Activities. Operations
  - Operand (operated on)
    - Patient
    - Product
  - Agent
  - Tools. Aids
  - Dependent Operations.

This structure allows the flexibility necessary for the introduction of further concepts yet provides a one-place location and thereby adequate definition in most cases for each concept.

To attempt a reasonable coverage of the subject field a variety of vocabulary sources was consulted: classifications, thesauri, standards, glossaries, etc. Where possible, provision was made for concepts to be synthesized, hence increasing the scope of the Intermediate Lexicon whilst maintaining some control over the vocabulary size.

The Intermediate Lexicon was given an ordinal notation.

For maximum flexibility two synthetic devices were used. The first is called a role designator, and has a number of modes of use. It can be used to:

(a) vary the semantic status of a concept. *e.g.* to change an operation (Op) into a product (Pd): Abstracts = Abstracting (Op→Pd) 9.810 (3.866) where 9.810 represents abstracting and (3.866) indicates the role designator which changes an operation into a product.

(b) to broaden the context in certain specific instances. *e.g.* to add the product to the operation. Indexing and Indexes = Indexing (Op+Pd) 11.610 (3.962)

It can be used in another mode:

(c) to perform a semantic transformation *e.g.* to negate a concept.
Non-users = Users (neg.) 5.05 (3.876)

(d) to specify the agent of an operation *e.g.* to specify a person (Pn) engaged in a particular task. Abstracters = Abstracting (Op→Pn) 9.810 (3.892)

The second device is called a specifier. This is complementary to the role designators, and allows any concept in the lexicon to be used as a specifier, *i.e.* a type or kind ('species' or quasi-species) of anything characterized by the specifying concept, *e.g.* Reference Libraries.

All role designators and specifiers (see examples) are indicated by round brackets.

It is possible to use either general specifiers, *e.g. small* books, or special specifiers, *e.g. chemical* literature, or personal specifiers, *e.g. Bradford's* Law.

Taking the example of small books, which is derived from small (3.038) used as a specifier to qualify books (8.155) as shown:

small (as a specifier) = small (sp.g) 3.038 (3.902)
where (sp.g) is a general specifier
small books becomes 8.155:3.038 (3.902)

As a rule general specifiers can be synthesized, but in cases where the use of a specifier involves a semantic change, *i.e.* the resulting compound is not clearly the product of the specifying concepts, then in this case the resulting compound is enumerated. For example: academic libraries can be synthesized from academic organizations used as a specifier and libraries, but public libraries should be enumerated, since 'public' is not representative of any one concept.

Testing the Intermediate Lexicon

Having determined a structure it is now possible to test the Intermediate Lexicon as a switching device. The questions to be answered fall broadly into three categories:

(1) Is it feasible to use the Intermediate Lexicon as a switching device and how would the switching performance vary when used with a variety of indexing schemes?
(2) If the switching performance is within acceptable limits, how will the indexes prepared from switched terms compare in retrieval tests with indexes obtained in the normal way?
(3) How can the Intermediate Lexicon technique be implemented in an operational environment?

The basic test procedure was switching indexing terms assigned to a given document using one scheme into indexing terms from a second scheme via the Intermediate Lexicon and then comparing the resulting set of indexing terms with a set obtained using the second scheme in the normal way.

BERNIER	→	INTERMEDIATE LEXICON	
Abbreviations		Abbreviation	2.70
Abridgements		Abridgements	8.075
Abstracting		Abstracting	9.810
Abstracting–Indexing Services		Provision: Abstracting	10.088:9.810
		+	
		Provision: Indexing	10.088:11.610
Abstractors		Abstracting: Agents: Persons	9.810 (3.892)

FIGURE 2: *Equivalence tables*

The switching procedure is aided by the construction of equivalence tables. Figure 2 gives examples from a table to switch from an indexing scheme to the Intermediate Lexicon, and figure 3, examples from a table to switch from the

Intermediate Lexicon to an indexing scheme. Both equivalence relationships and inclusion relationships from specific to general were shown.

In figure 4 there are several examples of terms switched from one indexing language to another. The second term, Academic Libraries, gives an example of term coordination, the third of synonyms, and the fourth of an inclusion relation, Meetings being a broader term in this case than Conferences.

	INTERMEDIATE LEXICON	→	BERNIER
2.70	Abbreviation		Abbreviations
⋮			
9.810	Abstracting		Abstracting
9.810 (3.892)	[Abstractors]		Abstractors
⋮			
10.085	Provision.Services		Services
10.088	(by Service provided)		
10.088:9.810 + 10.088:11.610	[Abstracting–Indexing Services]		Abstracting–Indexing Services

FIGURE 3: *Equivalence tables*

TERMS IN INDEXING SCHEME X		LEXICON NOTATION		TERMS IN INDEXING SCHEME Y
Periodicals	→	8.730	→	Periodicals
Academic Libraries	→	6.98:6.34	→	Academic Institutions + Libraries
Peek-a-boo Cards	→	12.632	→	Optical Coincidence Cards
Conferences	→	2.29	→	Meetings

FIGURE 4: *Switching procedure*

A series of experiments was performed to determine how the switching performance varied with:

(a) relative vocabulary size of the pair of indexing schemes between which the switching took place;
(b) the mode of indexing, *i.e.* pre- or post-co-ordinate;
(c) personal factors, *i.e.* the use of more than one indexer to index the same set of documents.

The set of documents used for the experiments were drawn from the Information Science Languages Test (ISLT) Collection Abstracts Set 2, Nos. 418–809 which were compiled for the tests at Aberystwyth by Mr. E. M. Keen and Mr. J. Digger.

The following five indexing schemes were selected for the tests, as taken in pairs they satisfied the testing criteria.

ASLIB.	*A Compressed Term Index Language for Library and Information Science.* Compiled by Alan Gilchrist and Kathleen Gaster (Aslib Research Department), with amendments by E. Michael Keen and Jeremy Digger (College of Librarianship Wales, Aberystwyth).
BERNIER.	*Thesaurus for Librarianship, and Information Science, Services and Systems.* Compiled by Charles L. Bernier. 13th Edition, May 1971.
SCHULTZ.	*Thesaurus of Information Science Terminology,* by Claire K. Schultz. (Revised Edition), 1968.
CRG.	*A Classification and Thesaurus of Library and Information Science,* by R. Daniel and J. Mills (with the assistance of R. Selwood), for the Classification Research Group, London, 1972. Published by the Polytechnic of North London.
UDC.	*Draft Proposals of UDC Schedules for Information Science, Information Handling, Documentation.* DP 1971:15. September 1971.

The indexing was not obtained directly from the abstracts, but from a set of concepts extracted from each abstract so that the same concepts were indexed using each scheme, and this then gave a reasonable basis for comparison. In figure 5 concepts a–e are indexed both by using Scheme X, second column and by using Scheme Y, last column. The terms from Scheme X are switched via the Intermediate Lexicon, third column into Scheme Y, fourth column, and compared with the results of direct indexing. It can be seen that c does not exist in X and a does not have exact equivalence. This is indicated by a dash.

CONCEPTS	TERMS IN SCHEME X	INTERMEDIATE LEXICON	TERMS IN SCHEME Y (switched)	TERMS IN SCHEME Y (indexed directly)
a	Xa′	ILa′	Ya′	Ya
b	Xb	ILb	Yf+Yg	Yf+Yg
c	—	—	—	Yc
d	Xd	ILd	Yd	Yd
e	Xe	ILe	Ye′	Ye′

FIGURE 5: *Comparison of indexing*

The switching performance was calculated by determining the proportion of terms switched which matched terms in the set obtained directly.

In figure 6,

T = number of matched terms
D = number of terms in the directly indexed set
I = number of terms in set obtained by switching from another scheme.

$$M_D = \frac{T}{D} \times 100\%$$

$$M_I = \frac{T}{I} \times 100\%$$

$$M = \frac{T}{D+I-T} \times 100\%$$

TEST NO.	NO. OF DOCUMENTS	VARIABLE	SCHEME X	SCHEME A	M_D	M_I	M
1	100	inter-indexer inconsistency					
a			Bernier (1)	Schultz (1)	68	74	54
b			Bernier (2)	Schultz (2)	65	70	51
2	250	same vocabulary size	Aslib	Schultz	47	52	33
3	250	large to small vocabulary	Bernier	Schultz	66	71	52
4	250	small to large vocabulary	Aslib	Bernier	42	40	26
5	100	post-co-ordinate to pre-co-ord.	Bernier	CRG	41	46	28
6	100	pre-co-ordinate to post-co-ord.	CRG	Bernier	51	69	41
7	100	pre-co-ordinate to pre-co-ord.	CRG	UDC	72	77	59

FIGURE 6: *Overall switching performance*

Results

Results indicated that differences in switching performance due to personal factors, *e.g.* inter-indexer consistency, was minimal (of the order of 3%).

It must be remembered that this was the translation of already chosen concepts into indexing terms.

On analysing the effects of varying the relative vocabulary size it was found that switching from a large vocabulary scheme to a small vocabulary scheme yielded better performance figures than switching between two schemes of the same size vocabulary, or from a small to large vocabulary size.

When use was made of the suppressed vocabulary or non-preferred terms which formed part of the structure of each thesaurus, the average performance rose to the order of 70%. For a number of reasons performance figures of 100% are unlikely to be achieved mainly because of the differences in coverage between any two schemes, and because the overlap of equivalent terms contained in a pair of schemes could be as low as 20%.

When considering differences in mode of indexing, *i.e.* whether the form of indexing is pre- or post-co-ordinate, the switch from pre-co-ordinate to pre-co-ordinate gave the best results. Full details of the tests can be found in a project report prepared by the author.[4]

It was concluded from the results that switching via an Intermediate Lexicon was a feasible procedure and we are now looking at question two—that of retrieval testing, and plans are also in hand for implementing the Intermediate Lexicon technique in an operational environment.

Acknowledgment is made of the grant from OSTI (now British Library Research and Development Department), and of the help and guidance given by Mr. J. Mills and Mr. E. J. Coates, joint project directors.

REFERENCES

1 NEVILLE, H. H. Feasibility Study of a Scheme for Reconciling Thesauri covering a common subject. *J. Doc.*, **26** (4), December 1970, p. 313–36.

2 COATES, E. J. Switching Languages for Indexing. *J. Doc.*, **26** (2), June 1970, p. 102–10.

3 DANIEL, R. *and* HORSNELL, V. *Intermediate Lexicon for Information Science.* School of Librarianship, The Polytechnic of North London, 1973. 43 pp.

4 HORSNELL, V. *Intermediate Lexicon for Information Science: a feasibility study.* School of Librarianship, The Polytechnic of North London, July 1974. 110 pp.

Choose your carpets with confidence

from DODSON BULL

UP TO 30% DISCOUNT

ALL LEADING BRANDS

Wilton ● Axminster ● Oriental ● Tufted

- All makes available with full Manufacturers' Guarantees
- Free delivery in U K.
- Expert fitting service available

£200,000 carpets on display

in our extensive London and provincial showrooms

Free brochure on request to Dept. ALB

DODSON-BULL CARPET CO. LTD.

LONDON: 5 & 6, Old Bailey, EC4M 7JD. Tel: 01-248 7971
BIRMINGHAM: 164, Edmund St., B3 2HB. Tel: (021) 236 5862
BOURNEMOUTH: 268, Old Christchurch Rd., BH1 1PH. Tel: 21248
BRIGHTON: 2-5, North Road, BN1 1YA. Tel: 66402
BRISTOL 2-3 Royal London Hse, Queen Charlotte St; BS1 4EX. Tel: 28857
EXETER: 157, Fore St., EX4 3AT. Tel: 32019
GLASGOW: 166, Howard St., G1 4HA. Tel: (041) 221 3278
LEEDS: 12, Great George St., LS1 3DW. Tel: 41451
MANCHESTER: 55-61, Lever St., M1 1DE. Tel: (061) 236 3687/8/9
NEWCASTLE-upon-TYNE: 90-92, Pilgrim St., NE1 6SG. Tel: 20321/21428
WESTCLIFF-on-SEA: 495, London Rd., SS0 9LG. Tel: Southend 46569
Open: 9.00-5.30 Mon.-Fri., Sat. 9.00-12.00 (Manchester 9.00-4.00)

Access to information from the USSR and Eastern Europe

G. P. M. Walker

Bodleian Library, Oxford

Paper presented at the 48th Aslib Annual Conference, Churchill College, Cambridge, 22nd–25th September 1974

Abstract

Western users of information from and about the area: types and characteristics. Sources of published information in the area: organisation and control of publishing activity, volume and peculiarities of published output. Unpublished and semi-published information. 'Uncontrolled' sources of information. Access to information: the indigenous tools for access and the Western-based information-processing efforts which index, abstract, translate and interpret. Problems of access to special types of information: political and economic, technical and scientific, commercial and academic. Acquisition and handling of information from the area by Western libraries and information services: distribution and adequacy of provision.

Introduction

I SHALL TRY in this paper to characterize briefly some of the information which comes from and deals with a single—though very important—geographical and political area; and to say something about the consumers outside that area who use the information. If you think you can detect an emphasis on academic libraries and their users—you can; and I can only invite comment and correction from those of your with more experience in other fields to correct the balance. My link with earlier contributors in this session, I am afraid, is a rather negative one. Unlike them, I shall be describing a situation where unco-ordinated effort and lack of co-operation have come to be regarded as normal. The softening of the international climate is already allowing increasing contact between this area and the rest of the world, and I shall indicate several openings for better collaboration; but the reflection may occur to you that, given the wide variety of information users with an interest in the Soviet Union and Eastern Europe, and the lack of sympathy existing between some of them and the authorities within the area, there is a limit to the coordination which we can expect in handling information about this (and perhaps some other) parts of the world.

The Soviet Union and the socialist states of Eastern Europe display political and economic structures which, despite recent developments, are still much more strongly marked by their likenesses than their differences. The same is true of their approach to information. The publishing and other information-producing bodies in each country parallel each other fairly closely in their terms of reference and the character of their output. This means that the range of

Aslib Proceedings 27 (2), February 1975, pp. 67–72. Printed in Great Britain

problems which they present to the outside information user are also much of a kind. For example, a limited knowledge of the languages they use has created a need for translated journals and English-language abstracts; shortages in the supply of their publications over many years has led to a flourishing market in reprints and microcopies; and most characteristic of all, the difference between the official assessment of a document and its evaluation outside Eastern Europe is often a wide one, so often as to make a variety of extensive services, monitoring, digesting and commenting on such documents and other media, financially viable or attractive enough—for various reasons—to be subsidized.

Sources of information

To look first at sources of information, and first of all at book and journal publishing: Soviet and East European publishing is subject to varying, but usually considerable, control by Party and government authority. The establishment of publishing houses, or of publishing activity by other organizations, editorial policy, finances, and individual publications, will all usually be determined or approved by decisions taken outside the publishing house's limits of responsibility. Within these limits, however, the publishing house will usually retain some scope for the commissioning and selection of titles and influencing the profitability of its list. The published output of nearly all the countries concerned is respectably high in international statistical comparisons, though perhaps not exceptionally so, considering the multinational character of most of these states and the amount of parallel publication in two, or many more, languages to which it gives rise.

A high proportion of titles—approaching 50 per cent in some countries—is not issued through the book trade, but by such bodies as Party and government organs, universities and research institutes. They usually appear in very small editions which are difficult to bring under bibliographical control and hard to acquire, even through the barter arrangements which many libraries have with Soviet institutions. The expressed demand for both commercial and non-commercial publications is often at variance with the numbers published, partly because of endemic paper shortages and partly due to a system of priorities which, for example, was found in one Soviet survey to satisfy a high percentage of readers' demands for mass-political literature and a much lower percentage of their demands for classic Russian authors.

From among the unpublished and semi-published information issued in the area, some report literature is now available to users outside Eastern Europe: many atomic energy reports, for example. Use of the Soviet deposit and microfilming scheme for unpublished research reports is now also possible, in this country through the BLL. Copies (usually microfilms) of Soviet and other East European theses are sometimes obtainable, with a higher success rate in the more sophisticated of the natural sciences.

'Uncontrolled' information from or about the area comes from numerous sources. By 'uncontrolled' I do not want to imply that these sources are themselves free from political, commercial or other constraints, but simply that the officially sanctioned controls applied to the bulk of Soviet and other East European documents do not affect them. They include the press surveys and newsletters issued by a number of British and other diplomatic agencies in the area; émigré publications and the bulletins of expatriate news agencies; and the material produced without authority within the area itself, ranging from full-length novels to letters of protest, which has been given the collective name of *samizdat* and can now be consulted in large quantities, notably in the multi-volume *Samizdat archive* now being edited by Radio Liberty in Munich. The monitoring reports, summaries and special analyses produced by the BBC, Radio Liberty and Radio Free Europe can also provide important information, though here it is the selection and interpretation, rather than the source itself, which are 'uncontrolled'—at least from within Eastern Europe.

Bibliographical access

Bibliographical access to indigenous published information is generally quite good, if somewhat tardy. Current national bibliography of books, serials, graphical material and music is fairly comprehensive except, naturally, for highly restricted matter. Much that *is* clearly intended for a limited readership or official use is recorded, though obtaining a copy is often a problem. Subject bibliography, indexing and abstracting is also fairly well developed, though ADP techniques are only just beginning to be applied. There are active documentation centres for scientific, technical and economic information in nearly all the countries concerned, and an International Centre for Scientific and Technical Information has been set up within Comecon to improve information flow between member countries and establish contacts with data banks in the rest of the world. One of its first projects is an automated registration system for Soviet serials which will be compatible with the International Serials Data System.

The most impressive service offered is, of course, by the 220 abstracting series of *Referativnyi zhurnal*, which is now linked with the reports deposit scheme. Other Soviet institutions now produce bibliographic coverage of the social sciences and, most recently, of culture and art, for which the Lenin Library is now issuing a range of bibliographic bulletins and abstracts. Most countries in the area publish abstracts of their chief scholarly journals in one or more West European languages. There are important questions of bibliographic compatibility still to be tackled: the USSR and some other countries in the area are preparing to introduce the format of the International Standard Bibliographic Description and probably ISBNs into their bibliographies; but I know of no active international collaboration to reconcile the problems of Cyrillic–Roman transliteration (and vice versa) with the demands of machine-readable records.

Access to information on Eastern Europe issued outside the area is chiefly through bibliographies and other publications intended for the scholar. Within the next year or two, he should be served by a set of annual bibliographies covering relevant books and articles appearing in English, French and German on both sides of the Atlantic. Exclusively for his benefit too, or the benefit of his library, have been the proliferating microcopying and reprinting programmes (especially of Russian books and journals) which are proving so hard to keep bibliographical tabs on, and at a recent count had passed the 8,000-title mark for works in Cyrillic alone. So far at least they appear to have suffered no check from the Soviet adherence to the Universal Copyright Convention last year.

Information users

Looking in more detail at the information users, some well-defined groups appear. Soviet and East European studies became a major *academic* growth point in American, and later in British and other universities, during the fifties and early sixties. The tradition of 'classical' Slavonic studies—literary, linguistic, historical and ethnographic—which had been fostered in a few institutions since the nineteenth century, quite suddenly (in academic terms) had added to it a massive research and teaching effort studying the contemporary social, political and economic scene in Eastern Europe, supported by substantial grants from governments and private foundations. Specialized library collections in these fields grew up almost overnight—as did specialized librarians, though at a slower rate! Information services appeared aimed at the academic social scientist. The American Association for the Advancement of Slavic Studies issues the *Current digest of the Soviet press*, which is now supplemented by computer-compiled indexes to *Pravda* and *Izvestiya* using 11,500 subject headings and covering mentions of Soviet individuals down to plant manager level; the Ford Foundation has sponsored the Glasgow-produced *ABSEES*, which abstracts over 3,000 Soviet and East European books and articles a year; and a Soviet and East European Foreign Trade Data Bank at Indiana University now holds over half a million entries. Except for a few services of this kind, however, the academic student of East European culture and society has been offered little from Western publishers beyond the traditional range of subject bibliographies. He is, however, probably the major consumer outside Eastern Europe of the bibliographical and information services produced within the area. The boom in these studies is ending now, and outside assistance is tending to be restricted to a smaller number of larger-scale research projects, such as the SSRC-supported work on the economic development of Eastern Europe at Oxford, and on political processes at Manchester and elsewhere. This change in the research pattern may alter the design of information services for this user group. It is hoped that one outcome of this month's International Conference of Slavists in Banff will be the establishment of an International Information Centre for Soviet and East European Studies, which will help to clarify present needs, and the Slavonic and East European Group of SCONUL is preparing a survey of the information requirements of researchers in the field with this in mind.

These researchers form a group apart from those (many of them also working from academic institutions) for whom the area from which the information comes is quite incidental, instead of a major determinant of whether to scan it or not. They are largely *users of scientific and technical data* and research results, are commonly less familiar than the first group with East European languages, and are the prime target of cover-to-cover translated journals and the variety of translation services offered by JPRS, the BLL and others. They are potential, though in practice infrequent, users of *Referativnyi zhurnal* and other East European scientific and technical information services.

Thirdly, *teachers of Russian* and other East European languages are the market for a wide range of courses and other teaching aids, including audio-visual material, now available—most notably for Russian. Although the growth of Russian language teaching seems to have reached something of a plateau, it is now being offered at about 700 schools in Britain alone, and degree courses with a strong element of Russian language instruction are being provided by over fifty British universities, polytechnics and other institutions. A new publishing house has been set up in Moscow, charged exclusively with producing the widest possible variety of instructional material for Russian as a foreign language. There are two British information services in the field: the Centre for Information on Language Teaching and Research in London, and the Materials Resource Centre of the Association of Teachers of Russian at Lancaster.

A fourth user group can be defined as *commercial and industrial*, working chiefly in the very demanding occupation of trading with the USSR and other socialist states. They consume specialized literature from within the area—export journals, national production directories, development plans—and a good deal of material is produced to assist their efforts by government departments (especially, in the UK, the Department of Trade), and by such common-interest organizations as the Russo-British Chamber of Commerce.

Finally, and necessarily more sketchily drawn, there are the information requirements of *government departments* concerned with developments in the Soviet Union and Eastern Europe, chiefly in the political, military and economic spheres. These requirements are generally met by information services which are not available to outside users, although important exceptions in the United States are the many non-restricted RAND and other reports produced under government contract, and the voluminous translated output of the Joint Publications Research Service.

Prospects

Looking ahead, I think we may hope that Soviet and East European publications will be more easily obtainable in future. The series of cultural and scientific agreements now established, and being regularly renewed, ought to offer scope for initiatives to improve the supply. At the same time it seems probable that the services which handle information about the Soviet Union and Eastern Europe will face more critical scrutiny and more competition for resources than before; and their case for continued support will be in essence the same as their clients' arguments for survival in conditions where fists are tighter and other parts of the world are claiming a greater share of attention than they did. We shall probably be seeing a leaner look about many of the abstracting, monitoring and assessment services as they come to be studied in cost-benefit terms. The amount of translation will certainly be affected by the amounts negotiated for translation rights with the Soviet Union under the Universal Copyright Convention. The fifty-odd British institutions teaching Russian and East European first-degree courses, at present to an average of about a dozen undergraduates each, are likely to find themselves a more select body. Even the East European acquisition programmes of some national and other large research libraries, drawing on their networks of dealers and exchange partners in a state of vagueness about the purpose of acquisitions which are not tailored to support specific research or teaching work, will need a more firmly founded line of self-justification than hitherto. The economics of my own library's dealings with its 130 East European exchange partners are already an object of considerable interest to the university auditor! But nevertheless I think cases are there to be made: information about this part of the world will remain vital to many people for many purposes, and libraries and information services owe it to themselves to know to whom, and for what, and what it is worth.

Directory of Review Serials in Science and Technology 1970–1973

Compiled by A. M. Woodward

A guide to regular or quasi-regular publications containing critical, state-of-the-art and literature reviews

£1.80; £1.25 Aslib members

SBN 85142 061 3

3 Belgrave Square London SW1X 8PL

Aslib Publications

DISCUSSION

Session 4: Access to information—international co-operation, foreign resources

MR C. G. GILES (Department of Industry) said that Dr Appleyard's paper was particularly timely as in the near future a new level of activity would probably begin in the scientific and technical information affairs of the Community, when the proposed Budget and Action Plan received approval by the Council. From the outset it had always been recognized that the European information network should be made available to what were known as 'third countries', so that he thought one could foresee the UK's participation in the system continuing, whether or not a decision was later taken to modify its membership of the Community.

So far the major part of the activity in scientific and technical information between UK and the Community had been at government level. This would now need to be broadened out, and the help of Aslib was being sought in arranging for this at the present time.

Mr Giles re-emphasized the importance of 'multilingualism' to the European network. British information systems interested in participating in the network should certainly consider how they would deal with questions and replies in the other Community languages. He cited the interesting example afforded by the French textile institute with its TITUS retrieval system as an example of the kind of thing which was feasible and effective.

MR A. E. CAWKELL (Institute for Scientific Information) asked Dr Appleyard about on-line services. Many librarians and information officers might well feel that on-line data base searching was yet another case of expensive technology looking for an application. However, it seemed likely that on-line services were about to take off in the United States, partly because national communication networks were accessible throughout the country. He cited the services offered by ISI as an example.

In Europe he feared that Dr Appleyard would have a daunting task in implementing networks which will make services of this kind generally available, whether governmental or commercial. The PTTs had a communication monopoly. One had demonstrated its attitude by slapping a prohibitive surcharge on a service operator who was so bold as to ask if he could hire lines for on-line retrieval services. This was not a good omen for the competitive availability which Dr Appleyard felt was necessary.

It appeared that governments could lean on their PTTs if they so wished. Presumably they had leaned when the airlines asked for facilities for their seat reservation and traffic control systems. Did Dr Appleyard feel that he would be able to move these entrenched elephants in the foreseeable future?

DR APPLEYARD replied that something had to be done, and acknowledged that at present it could be cheaper to use some European data bases in the USA, rather than in Europe.

MR R. GROEGER (John Laing) asked what was being done within EEC about indexing of trade names and products. Was the development of any new systems being supported?

DR APPLEYARD replied that nothing had yet been initiated.

DR D. G. ROWLANDS (Unilever Ltd) took up the point that existing on-line retrospective retrieval systems were not very good. In general, this was so, but the situation would not improve unless a considerable amount of development and evaluation was done. For this work to be done on a realistic basis, very large data bases would have to be used. Most of these were located in countries other than the UK, and in order to do the necessary research one needed on-line access to them via a telecommunications network. Attempts to do such research had been continually frustrated by the destructive attitude of the UK Post Office, and most of the Community PTTs, towards existing international networks. Unless this attitude was changed, the necessary research would never be done in the UK or in Europe.

MR R. SEWELL (British Steel Corporation) expressed concern over the lack of information about EEC's plans regarding metals information.

DR APPLEYARD replied that there were now 30,000 items in the STIM data base, of which 20,000 were the German contribution. The French contribution was now coming in. He thought that within a few months a worthwhile tape would be available.

MR F. A. SEAMMEN (Meteorological Office) offered consolation to Dr Appleyard by recalling that the meteorological services of the world had recently celebrated their centenary of co-operation in the exchange of real-time meteorological information. Where the need was great, results would come.

MR FRANK C. HIRST (MAFF) introduced himself as the UK linkman to EURAGRIS, and mentioned that he would welcome input and suggestions for input (serials, reports, semi-published material of UK origin) and would be happy to supply information about the continuing progress of EURAGRIS.

MISS JANE FRANCIS (British Steel Corporation), referring to Mr Chaplin's paper, expressed satisfaction with the progress made by IFLA towards international co-operation, but asked what had happened to FID's work on UDC.

MR CHAPLIN, in reply, agreed that it was desirable that the basic bibliographic record should include a subject indication. He hoped that national contributors could be persuaded to do this using a common system—perhaps SRC.

SCIENCE INFORMATION SOURCES

A Universal And International Guide
Second Edition — Revised And Enlarged
A.S.T.R.I.D Information Science Series No. 4
Herman-Karel de JAEGER
(Member : ADBS - ASIS - ASLIB - DGD - FID - IMA - SLA)
ISBN 90 70078 04 X — 1974 — 148 pp. — Hard-Cover —
430 Entries — 900 Subjects — Dutch Guilders 47,50

REVIEWERS PRAISED THE FIRST EDITION :
„.... important ..." (P. Bridge, Library of Congress) — „.... invaluable ..." (Ch. Bauer, Lockheed) — „....very up to date ..." (Chr. Thirion, Bulletin des Bibliothèques de France) — „.... most welcome ..." (A. Harvey, British Museum) — „.... very helpful ..." (C. Dammous, Westinghouse Electric Nuclear Energy Systems Europe) — ...

Order from your local bookseller or direct from :

SIS - BOOKS

P.O. Box 1017
NIJMEGEN (Holland)

Letter to the Editor

Sir,

I have read with interest the paper by B. Houghton and C. Prosser in *Aslib Proceedings* for September 1974, which reports a survey in industrial libraries on the effects of non-immediate access to journals. Unfortunately the questionnaire failed to enquire about a vital part of this matter. I have several times in articles referred to the likelihood that failure on the part of an information service to provide an *immediate* response to an enquirer looking for a lead towards a solution of the problem on which he is working may turn his thoughts in other directions, sometimes profitably. Indeed the very act of deferring consideration while an original paper is being obtained may release the enquirer's mind from immediate pressures of concentration and allow the Crossword Puzzle Effect to take place. This is the known phenomenon whereby one may reach an *impasse* in attempts to solve a puzzle only to find, on taking it up again much later that the brain has worked to find solutions while apparently otherwise occupied. What needs to be investigated is to what extent delays *cause* alternative solutions to arise, and the proportion of those alternatives which are preferable to solutions which would have resulted from the immediate provision of information.

None of the questions used in the Liverpool survey would have elicited these facts because of the assumption that the only answer for the enquirer lay in the awaited paper and no progress on his research could be made by following some other lead in the meantime.

Yours faithfully,
WILFRED ASHWORTH
Chief Librarian, Polytechnic of Central London

BRIEF REVIEWS

ACCESS TO THE LITERATURE OF THE SOCIAL SCIENCES AND HUMANITIES: Proceedings of the conference on Access to Knowledge and Information in the Social Sciences and Humanities, New York City, 5–6 April 1972. New York: Queens College Press, 1974. 199 pp. $12.50.

In 1972 a conference on Access to Knowledge and Information in the Social Sciences and Humanities was organized by the City University of New York. The conference had three broad aims. These were: to review the present state of indexing and bibliographical control in both the social sciences and the humanities; to define major theoretical and practical problems in the identification, organization and utilization of information and knowledge in the light of user needs; and to draw attention to the implications of these problems for schools of librarianship and information science.

These aims are reflected in the arrangement of this book which, in the main, consists of the papers that were presented at the 1972 conference.

On the theoretical side the book contains papers by Ilse Bry (on what she calls 'sociobibliography') and Laurence Heilprin (on the relationship between cybernetics and information science) as well as some critical comments by Theodore Hines on the construction and use of indexes in the humanities. However, a significant part of the book is devoted to descriptions of actual systems and services. These include the Modern Language Association Bibliographical System, the Social Science Citation Index, an outline of the ERIC System and a detailed description of the procedures used by the H. W. Wilson Company in the compilation of its indexes. In addition, there are also discussions of the impact of computer technology on access to information in the humanities by Joseph Raben and Thomas Parr.

Finally, mention should be made of Jesse Shera and Margaret Anderson, who have provided both a short piece on the place of the librarian in society and a statement on the implications of the conference for education in librarianship and information science; also of Maurice Line, who not only presented a paper on the information requirements of social scientists but who has also added a postscript to the volume in the form of an analysis of future research needs.

SURRIDGE, R. G. Management information in the Bromley Computerised Book Charging System. MA Dissertation, UCL, 1973. 2 fiche, 65 pp. *Available* from R. G. Surridge, 3 Dower Avenue, Wallington, Surrey. Microfiche £3; hard copy £4 plus p.p.

This dissertation deserves wider distribution to both libraries and library school students as a good example of systems analysis in a library setting. The importance of management information in running a large library system is emphasized. The planning of the computerized book charging system followed the development of the Bromley Library Service from five previously separate local authority systems in the metropolitan boroughs' reorganization of 1965. There was active involvement with the Management Services' Unit of the

Borough, which was commissioned to study the automation of book loans and returns, together with the associated functions of overdues, renewals and reservations.

The background to the development and implementation of the computerized book charging system is given, with an appraisal of the system after nearly three years of operation. In addition to clear descriptions of both manual and mechanized elements, development and operational problems are discussed. There is a particularly helpful section on the 'Reservation Problem', detailing the requirements of an effective system, outlining approaches to solutions, and the final methods adopted. The manual and computerized reservations procedures are compared.

Some of the benefits obtained from the new methods are summarized, for instance the greater control of book loans, the elimination of queues at the discharge station, the reduction of routine effort in certain areas of work. The time and attention given to planning and training staff well in advance is reflected in their acceptance and approval of the new system.

The benefits expected from the provision of information for planning and decision making are well illustrated by the examples of computer printout included in the appendix. Some of the information raises more questions rather than indicating answers: questions on the appropriateness of loan periods, renewal policies, and even staff recruitment and training. Perhaps, as so often, the largest benefit will derive from the opportunity created for a fundamental reappraisal of the information required for library management. Meanwhile, as the author says, the information from this system 'enables more sensitive and equitable resource allocation', and the clearer understanding we can obtain of users' needs and requirements and operational constraints, the more effective systems we can design.

EMMANS, K., HAWKINS, E. *and* WESTOBY, A. Foreign languages in industry/commerce. York: Language Teaching Centre, 1974. 170 pp. £3.50.

This is a report on a pilot survey of British industry's manpower requirements in foreign languages. Despite technical difficulties three areas were investigated: (1) foreign language graduates were surveyed to discover what use was being made of their skills; (2) in an attempt to measure industry's view of its need for foreign language skills, job advertisements in *The Times, The Daily Telegraph, The Financial Times* and *The Sunday Times* were analysed for the frequency with which language skills were required; (3) a survey was carried out of both management and employees, in a sample of forty firms, to assess their opinions of the use of foreign language skills. The results show that in most cases there are very few jobs which require foreign language skills and that usually these skills are merely ancillary, their use occupying a small percentage of the total working time. The major foreign language activities in order of priority were: (1) reading the foreign language; (2) translating into English; (3) conversation. French, German, Spanish, Italian and Russian were the five major languages required, with Portuguese and Dutch being comparable to Russian. Appendixes include discussions of problems involved with the techniques used and questionnaires used.

COBLANS, H. Librarianship and documentation: an international perspective. London: Deutsch, 1974. 142 pp. £2.95. (ISBN 0 233 96596 3)

Influences on the development of librarianship and documentation in an international context are discussed. Such historical factors as printing, photography, microphotography and copyright acts have all contributed to librarianship. Library development is followed from medieval attempts at universal bibliography through international bibliographical control by the Institut International de Bibliographie and Fédération Internationale de Documentation (FID) to Licklider's futuristic concepts. FID and the International Federation of Library Associations are discussed in their historical context. Unesco and UNISIST have been extremely influential in the development of librarianship through international conferences, aid to developing countries and publishing programs. Other influential bodies are: OECD, reviews of science and science information; FAO, production of AGRIS, and IAEA, which produces INIS, and private organizations, e.g. Chemical Abstracts, UKCIS, Biological Abstracts, INSPEC. Present trends are towards national information networks, rationalization of services and more economical operations.

PLANT, M. The English book trade: an economic history of the making and sale of books. 3rd ed. London: Allen & Unwin, 1974. 520 pp. £8.50. (ISBN 0 04 655012 7)

This book, which covers the economic aspects of the transition from the medieval manuscript to the modern book, is now issued in its third edition. The statistical data have been updated to 1970 or after. It contains fuller details on some subjects, for example, trade unions and sales promotion, and new sections on photocopying and the book trade, Public Lending Right, paperbacks and international publishing.

LYNES, A. How to organize a local collection. London: Deutsch, 1974. 128 pp. £1.95. *Grafton Basic Texts.* (ISBN 0 233 96452 5)

The growing interest in local studies in recent years, combined with new methods and materials of historical research have given public libraries an increasing responsibility to provide the means for such a study by the maintenance of a local collection. This work is based on personal experience with Coventry City Libraries' Local Collection. The functions of a local collection, fields of local study, types of material, and the position of the local collection in relation to the record office, museum, art gallery and other libraries are described. Methods by which material can be acquired are explained, together with ways of organizing it to ensure maximum usefulness. Problems of staffing and provisions for reader services are discussed.

The 1974–5 edition of

THE

WORLD OF LEARNING

is now available

This new edition, the 25th, is the result of a year of painstaking research and correction by an experienced team of editors and contains details of over 24,000 universities, colleges, libraries, museums, art galleries, learned societies and research institutes and the 150,000 people active in them.

After a quarter century of publication The World of Learning is universally recognised as the most comprehensive guide to educational, cultural and scientific institutions in the world and as a work without which no reference library is complete.

Price £18.50 (two Volumes) *1,985 pages*
Size 8 × 10 in *ISBN 0900 36288 X*

Order from any good bookseller or direct from:

Europa Publications Limited
18 Bedford Square
London
WC1B 3JN.

British Technology Index

CURRENT SUBJECT GUIDE TO BRITISH TECHNICAL JOURNALS

FOR TRACING AND RECALL

of $\left\{\begin{matrix}\text{specific}\\\text{recent}\end{matrix}\right\}$ information

in the Field of Applied Science, Engineering and Manufacturing Technology

Monthly Parts and Annual Volume

THE LIBRARY ASSOCIATION

7 Ridgmount St. Store St. London, WC1 7AE

(Phone: 01-636 7543)

21 JUN 1975

Does Your Research Association Suffer From Information Constipation?

THOSE AT RISK

R.A.'s who
Index more than 5,000 documents a year
and Are required to provide a comprehensive Information Service to their Members

THE SYMPTOMS

- * Lengthy turn-around time in answering Members' queries
- * Poor utilization of the Information Department facilities by research staff
- * Inadequate Precision and Recall in retrospective searches
- * Printed Subject Indices, SDI Lists, Current Awareness Lists, etc usually produced late

THE CURE

CAIRS is a minicomputer-based Relational Indexing System designed to meet the needs of most Information Departments. Because it resides "in-house", security of confidential information is under the control of the Research Association.
CAIRS permits the user to conduct fast interactive searches on a variety of keys (eg Author, Subject, etc) and—because it is an on-line system—allows the user to modify his search strategy in real-time to suit his particular requirements. In addition, the system can automatically generate various lists *in a state ready for immediate printing.*

THE COST

CAIRS is not cheap—although it's a lot cheaper than you think. So why not write to the address below for more details and do your own Price/Performance analysis. We think you'll be pleasantly surprised.

The Technical Sales Manager, Libra Information Systems Limited,
Chaudhuri House, Addington Street, Margate, Kent CT9 1PW.

BOWKER

How to Manage Scientific Growth:

1. Resort to **SCIENTIFIC BOOKS IN PRINT 1974** for the fullest bibliographic control of more than 52,000 U.S. works now available—titles covering over 12,000 scientific and technical subjects, from Algebraic Topology to X-Ray Crystallography. Use it to compare prices and publication dates; to enrich subject collections; to help your readers find material for their research and reports. *Subject/author/title indexes* give detailed publication and ordering facts for every entry.

SCIENTIFIC BOOKS IN PRINT 1974

£17.50 net

Just published 11 × 8½ 1,850 pages

ISBN 0-8352-0747-1

2. Use **SCIENTIFIC, TECHNICAL AND ENGINEERING SOCIETIES PUBLICATIONS IN PRINT 1974-75** for tracing the output of 151 major U.S. scientific and engineering societies. This is the unique source for locating thousands of valuble materials in energy, environmental research, mass transportation, food resources and other branches of technology. Save time searching for specialist reports and corresponding with engineering societies for their latest data: They're all on record in

SCIENTIFIC, TECHNICAL AND ENGINEERING SOCIETIES PUBLICATIONS IN PRINT 1974-75

£10.00 net

Just published 11 × 8½ 223 pages

ISBN 0-8352-0727-7

BOWKER PUBLISHING CO LTD
Epping Essex CM16 4BU (*tel. Epping 77333, telex 81410*)

21 JUN 1975

Published in England by Aslib, 3 Belgrave Square, London SW1X 8PL
Printed at the Alden Press, Oxford

Aslib Proceeding

Future pattern of information services for industry and commerce *David Scarfe*

Need for versatility in a small research library environment *Shirley Lowndes and Ian Sharp*

Costing of library systems *D. W. G. Clements*

Architects wants and needs for information, demonstrated through a university based information service *Christine Snow*

MARCH 1975
VOL. 27, NO. 3

In-Training in Information and Special Library Units

Elizabeth Mack BSc, FLA, MI Inf Sci

In-training is defined as training given or received with direct relevance to and during employment; it is taken here to include induction training, post professional-education training, and traineeship

£2.50; £2.00 Aslib members

SBN 85142 062 1

Directory of Review Serials in Science and Technology 1970–1973

Compiled by A. M. Woodward

A guide to regular or quasi-regular publications containing critical, state-of-the-art and literature reviews

£1.80; £1.25 Aslib members

SBN 85142 061 3

3 Belgrave Square London SW1X 8PL

Aslib Publications

Aslib Proceedings

VOLUME 27 MARCH 1975 NUMBER 3

© 1975 Aslib and contributors

Aslib Proceedings *is published monthly and supplied free to members of Aslib. Subscription rates are £18.00 annually to non-members, or £9.00 to Aslib members requiring additional copies. Single copies £1.70, or 85p to members.*

Further information about Aslib's services and membership rates will be supplied on application to the Director, Aslib, 3 Belgrave Square, London SW1X 8PL. Tel: 01-235 5050. Telex 23667; answer-back, Aslib London.

Notes for contributors

Aslib Proceedings now accepts contributed papers in addition to those presented at Aslib meetings and conferences. They should be of a practical nature and of some relevance to problems encountered in the everyday operation of library and information units, or services. Other kinds of contribution which will be considered for inclusion are short notes on new information units or special libraries; the introduction of new techniques or systems in existing libraries where these may be of general interest; equipment designed by members for special purposes and put into operation in their own organizations; and objective reports on experience with new 'packaged' commercially available information services.

Contributions, which should be typewritten, double spaced, single-sided on A4 paper, and not more than 3,000 words in length, should be addressed to the Editor, *Aslib Proceedings*, 3 Belgrave Square, London SW1X 8PL. If possible, authors should include a summary of up to 200 words with the typescript. Authors will receive twenty-five offprints of their article free of charge.

Jubilee Prize Award—winning entry

The future pattern of information services for industry and commerce

David Scarfe

Central Management Library,
Civil Service Department

THE ORIGINS OF information and library services in British industry and commerce are not well documented, and are a difficult field of study for the historian: much early activity was spontaneous and informal, and therefore unrecorded, and the consequent difficulties of research in this field are well defined in Margaret Marshall's 'British industrial libraries before 1939'.[1] A major problem in gaining an overall view of the development of these services is the fact that only success stories are published in the professional press; it would be invidious to single out particular examples for comment, but a number of highly successful services have been summarily dissolved by management decision in the past decade. I have been unable to trace any published study on the causation underlying these decisions, and a vital element is therefore lacking in our appreciation of the past development of information services, but an awareness of previous successes and failures is a necessary condition of any attempt to predict their future.

Industrial libraries and information services have a comparatively short history, commencing in the 1870s, and the hundred years which have elapsed since that date have seen vast changes, both in industry and in social organization as a whole: in the early part of this period the Industrial Revolution was causing a major shift of the workforce from agriculture into industry; in the later part two world wars, and their economic aftermath, resulted in major changes in the relative importance of different types of industry and commerce, exemplified by the massive expansion of the chemicals and electronics industries, and the decline of the traditional heavy engineering industries. Today, we appear to be entering a third phase, typified by the growth of the so-called service industries; and there is evidence of a further shift of the workforce away from the manufacturing industries, producing tangible, material goods, into areas represented by the computer software industry, which employs large numbers of skilled personnel in the creation of relatively intangible products.

The efforts of the pioneers in the provision of information services to industry were largely confined to the manufacturing industries, and in particular to those areas of industry which by their nature are of prime importance to the country's economy, are heavily capitalized and dependent on R & D effort: these firms may enjoy various forms of state subsidy, are often of large size and capable of at least a degree of self-financing, and are less reliant on aggressive promotion to capture a viable market share. Even in these areas, which include chemicals, steel, pharmaceuticals and aerospace, there have been notable casualties among

Aslib Proceedings, 27 (3), March 1975, p. 80–89. Printed in Great Britain

apparently successful information services. The current position in the newer industries is not clear, but it is becoming apparent that in certain fields, notably electronics, computer manufacture, and computer software, it has not been possible to establish permanent, viable information services, and that information as such is given a relatively low priority by management. There are signs that the service industries are revising their attitude towards information, and that expansion is taking place in this area, but these industries may be expected to be quickly affected by an adverse world economic climate.

The picture which emerges is one of strong information services in the older manufacturing industries, and generally weaker, more vulnerable services in the newer manufacturing and service sectors. This is not a healthy situation: as mentioned briefly above, the short time during which information services have been operating has encompassed enormous structural changes in world industry and commerce, and there is every reason to suppose that the next decade will introduce even greater changes, the consequences of which cannot yet be measured. Change itself is, paradoxically, a constant, and the only certain prediction we can make regarding the future of the services which we attempt to provide, is that their pattern will be largely dictated by apparently cataclysmic upheavals quite outside our control. This should not cause alarm: the neolithic agricultural revolution changed man from an omnivorous hunter and gatherer into a farmer living in settled village communities in ten thousand years, an incredibly short space of time; and the problems which we face, from the energy crisis to over-population, are of no greater magnitude. In the short term, however, and within our own area of activity, it is disturbing that those areas in which strong libraries and information services exist are those apparently most threatened by structural change in industry; that the emerging industries have not considered the establishment of effective information services as meriting any priority; and that the information profession as a whole has not succeeded either in presenting itself as an important source of specialized expertise, on a par with accountants and lawyers, or in evolving professional skills which would enable it not only to meet present needs, but to foresee and anticipate future demands before they occur.

Complacency is the besetting sin both of libraries and information services: 'Once the stature of *library* is achieved, a dynamic self-assertive attitude becomes unnecessary. . . . When all the propaganda from information departments has succeeded, the same climate will apply, and complacency will creep in.'[2] Very few organizations of any kind, except perhaps a small number of highly specialized research institutions, maintain constant and unchanged objectives over a period of many years, and *all*, without exception, operate in a complex and ever-changing environment. The information profession must learn to accept that the organizations which they serve, and the information services which they provide, have a finite life which will be terminated at some point in the future, and that during their lifespan aims, objectives and resources will change radically. Too many information services have evolved into self-perpetuating bureaucracies (Figure 1), continuing to perform automatically the tasks for which they were originally created, unaware that these are no longer relevant to the needs of the parent body, and incapable of constructive heads of operational divisions or project teams, whose efforts will be coordinated but not closely supervised by the information manager, and who will be able to rely on professional and clerical support from a central body (Figure 2).

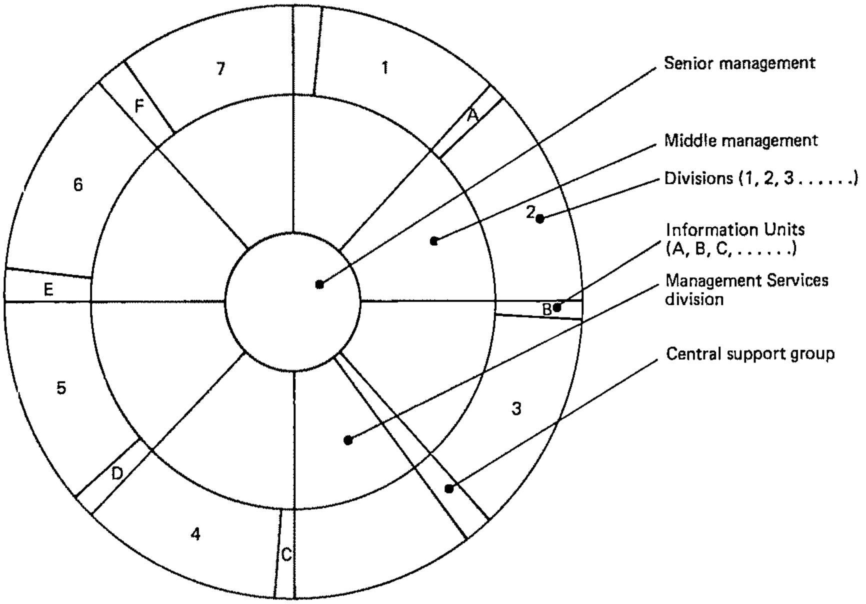


FIG. 2

A new pattern of information service will therefore have been evolved, primarily to meet the overriding need of the information manager for detailed information on the continuing aims, problems and constraints of the constituent parts of the corporate organization: if he is then able to obtain a suitable position himself in the central management hierarchy, he will be well placed to create and maintain a realistic picture both of the aspirations and the actual working of the organization, and the first condition for running a successful service will have been fulfilled. A timely and accurate assessment of changing organizational activities having been achieved, it remains the task of the information manager to exploit this knowledge, and to ensure that appropriate information flows are initiated within the organization, between its constituent members, and that appropriate information is drawn in from outside, and directed into the correct channels.

The structure for doing this has been briefly outlined above, but will be here reiterated in more detail: it will consist of operational information units, of small size, staffed by junior professional personnel, directly responsible to divisional management, and intimately involved in the work of their divisions or project teams; their primary aims will be to identify precise information requirements, to ensure that the need for information is correctly perceived by the user, to be fully conscious of all information channels into, from, and within their departments, and to report all relevant information to the information manager. They will be free from the need to carry out cumbersome clerical procedures, and will have no commitment to maintain major, long-term or in-house SDI, awareness bulletins or indexing systems; they will have no requirement to carry out peripheral and only indirectly justifiable procedures in the form of classification and cataloguing. Expenditure on these units will consist largely of staff costs, and they will therefore be flexible, capable of quick response to changing demands, and subject to rapid re-organization or total abandonment to meet changing corporate policy. Their success will depend largely on the quality of the staff employed; particularly on their ability to reconcile deep subject knowledge, and identification with on-going specialized projects, with a recognition of the fact that their function is essentially that of exploiting existing information sources, not the organization and creation of new resource centres. A fundamental problem for the information unit staff will be to balance loyalty and commitment to local managers and project personnel against responsibility to the information manager, and overall corporate information policy requirements.

Information units of this nature will inevitably be restricted in scope in comparison with the larger 'library' type of organization common today, and they will evidently require the assistance of a central administrative infrastructure to provide a wide range of support functions: these will include both basic clerical assistance in the routine tasks of inter-library loans, materials acquisitions, and stock control, and also simple routine professional tasks, in the form of any cataloguing and classification, routine indexing, and vocabulary control which may be required. This section will provide the essential link between the local information units, and the large national and international resource networks which are steadily growing in effectiveness, acting as a clearing house, receiving requests for specific information and redirecting them, and maintaining an awareness of the range of multidisciplinary information sources now available on a commercial basis.

The information manager himself will provide, possibly with the assistance of a highly skilled staff, a centralizing nucleus for the management of the relationship between the units discussed above, and will monitor and control the total flow of information within the organization, relying upon intelligence from the specialized units for a detailed appreciation of corporate developments: he will assess the cost-effectiveness of the various units which comprise the service, and their benefit to the organization as a whole, and will redeploy resources, reduce or increase expenditure as necessary. He will create a framework which will exploit information originating within part of the organization to the benefit of the whole, and be accountable for the effective use of bought-in information, and the evaluation of commercially available SDI services, retrospective information retrieval services and other external sources of documentation. A major task will be the establishment of a realistic working relationship with management, seeking to initiate a flow of information on changing priorities and objectives from the policy and decision-making strata; and advertising the capabilities and limitations of the service, and its contribution to the achievement of corporate objectives at a high level, by providing the right information at the right time, in an acceptably packaged form.

The advantages of such a decentralized system, consisting of (1) small operational information units attached to executive divisions, (2) a central clerical operations and support group, and (3) an information manager or central information policy unit are as follows: a closer relationship will be maintained with all levels of the corporate hierarchy, removing the dangers of anonymity and promoting personal confidence and communication; a two-way flow of information will be more easily attained, ensuring a continual modification of the information service's aims to keep in step with those of the parent body; and perhaps most important, the information manager in overall charge will have a very much more flexible machine at his command, having invested little emotional capital in the creation of a large resource base, demanding a continual diversion of professional effort to its maintenance. Concomitant disadvantages are largely those associated with the difficulty of creating efficient mechanisms for the control of a diffuse structure, and evaluating the contribution of individual units to the overall effort, but these will be overcome by the energetic and efficient manager.

While this is certainly not a new concept in the commercial sphere, this type of structure is as yet uncommon, and the reasons for this should be examined. A major obstacle in the past has been the almost total lack of a suitable commercial infrastructure, which would enable the director of the service to promote the philosophy of regarding information as a purchasable commodity like any other, evaluating its benefits and costing its acquisition before buying it in from outside the firm. This has only become at all feasible within the past two decades, and the result has been that information has been acquired painfully from a multiplicity of sources, at low capital cost, but at a high cost in staff, accommodation and equipment. It must be admitted that in the scientific area SDI, abstracting and indexing services have been available for many years, but in the commercial sector external services have been limited in their scope to basic financial, patent and product information. The British Library, in its various manifestations, has fulfilled and continues to fulfil a vital role in the overall national pattern of information provision, but it has very properly limited its role to that of an extremely comprehensive, highly competent, but intrinsically passive support service; and one suspects that it is only those organizations with strong, professionally expert and well-staffed information units which have been capable of making the maximum use of the facilities which it provides. This lack of a commercial sector is now being remedied, in part by a more aggressive approach to the selling of information by learned institutions and industrial research associations, and partly by the exploitation of the sales potential of market surveys and similar studies in technical evaluation and forecasting (*e.g.* the massive study on the market for data transmission carried out recently on behalf of the European PTTs[3]).

More damaging, perhaps, has been the unfortunate fact that whereas it is possible for senior management to call in consultants to analyse, document and produce recommendations for the restructuring of a nascent or an existing information service, it has not been possible for the leader of an existing service to call in the assistance of skilled temporary staff to deal with a specific but transient need, in support of a specific but finite project, without considering that he is calling his own competence and that of his personnel, into question. This may be due partly to a lack of education both of management and the information worker; but it is also largely a result of the exaggerated claims made by consultancy firms in the past, who have succeeded in giving the impression that they are able to provide a panacea solution to all of a company's information requirements after a few man-hours of work, but have been reluctant to involve themselves in any longer-term commitment, and to carry through the solutions they prescribe. A market niche undoubtedly exists for these firms, but there remains a clear need for a radically different type of commercial information consultancy service, which would exist to provide temporary, skilled staff in support of specific but finite tasks, requiring a relatively massive staff commitment. There is also a demand for external contractors capable of performing large-scale, specialized information searches, exhaustively covering a wide range of different media. Weakness in this sector has affected not only the larger, institutional information services, which may often be relatively overstaffed in relation to the essential services they are required to perform, but find themselves unable to redeploy staff from redundant routine activities due to organizational inertia, but has had particularly bad effects on the small information unit in the smaller organization, whose inability to meet important short-term peaks of demand has led to a breakdown of the service to their regular clientele, and failure to perform adequately in the major project.

The reluctance of information personnel to place any reliance on outside services has been unfortunate, as it has run counter to a general trend in management in recent years to acquire specialized expertise from outside the organization wherever necessary. The company lawyer or architect does not feel his position threatened if asked to advise on the best experts whom his firm may employ in his specific field, as it is part of his professional responsibility to provide this information, and the potential gain in flexibility to the information manager if he is prepared to take this step should be considerable, especially if he can persuade his firm to employ specialists of high calibre and considerable professional standing. The selection of these specialists will be a real problem, as will the valuation and selection of any external services, and their subsequent integration into the total service: knowledge of the techniques of evaluation is not widespread, and a considerable effort of education will be needed before the profession as a whole is ready to assimilate them into its general practice.

Although much attention has been paid to the effect of new technologies on information services in the recent past, their application is essentially contingent upon the existence of suitable organizational structures to permit their effective utilization. It is not sufficient to mechanize existing indexing and abstracting systems, useful although this may be; and the major possibilities now developing would appear to lie in the use of data communication networks to access large remote bibliographic data bases, and to encourage their direct use by the eventual recipient and user of the information. The performance of exhaustive information searches on large data-bases, and the integration of the results into local, personal or task-orientated files, should permit the automatic generation of accurate SDI profiles; and as feedback techniques become more advanced, it should be possible to regularly update user profiles by analysis of items selected from the regular listings thus produced. The problem for the information manager is to create a workable structure which will utilize computer facilities installed for other purposes, and to convince senior management that expenditure on such activities contributes to the overall aims of the firm.

More important to the future of the information service, in the long term, is the decisive move away from the printed document as a source of data or information towards less easily conceptualized sources, embodied in the data bank and the management information system. A silent explosion of information has occurred in government, local administration, and all forms of industry and commerce, based on the capacity of the computer file (whether disc, tape, card or drum) to hold enormous quantities of pure data; this explosion in storage is now matched by a comparable expansion in the capability of electronic devices to automatically acquire data and transmit it through complex and enormous networks. It is debatable whether most organizations possess suitable and efficient mechanisms for the definition, organization, selection and presentation of the vast quantities of data now being made available to them. The majority have certainly concentrated on the essential areas of cash flow, production statistics, payroll and personnel policy, but have made little effort to integrate these into an overall picture. Few firms have taken maximum advantage of large files of pure data for forward planning and forecasting, and few have made any effort to incorporate comparable information from outside sources into their own data bases, even although it may be available at relatively little cost. The implications of these developments are considerable, however, in that they foreshadow a move away from conventional materials, and therefore away from conventional resource centres, and it is vital for the information manager to identify himself closely with the use of these new repositories of information if he is to continue to play a useful part in the work of his organization. The opportunity is present for him to do this, but only if the information service is sufficiently closely integrated, and identified with the management structure of the parent body, for him to perceive and to fill a vacuum which may exist; and he must discard the outdated functions and materials of the library or information centre on the way.

Controlling the unique and intangible resource known as information, within the flexible and diversified organizational framework of the new information service, will demand the development of effective means of monitoring and controlling the operation of the system. Management information systems in miniature, and simulation modelling will be applicable, but these are generalized management techniques, and their application to information systems is not yet fully understood. It seems likely that further research will be necessary before our comprehension of the operation of our own systems is sufficiently clear for us to establish valid, absolute criteria against which to measure the effectiveness of commercial information systems, but management techniques will be increasingly used as our understanding grows and deepens.

Staffing the information service of the future will not be easy, given the present pattern of education for information work, which interposes an absolute barrier between the librarian and the information scientist, and an equally absolute barrier between trained and untrained personnel. The former share a commitment to an abstract, idealogical conception of their work, although they differ fundamentally in their attitude towards source information; the librarian confining himself to the organization of a basically static collection of data and opinion, whereas the information scientist claims to organize, select and evaluate the information, before packaging it and presenting it to the user. Although their training may afford them expertise, their attachment to an ideal often results in an inflexibility of outlook, and a standardized approach to the infinitely variable problem of developing a suitable information system for a commercial organization. Non-professional staff, often possessing considerable subject expertise, do not generally share this disability; but their lack of training often leads to the adoption of inefficient techniques and procedures, although this may be more than compensated by their greater commitment to the organization, and enhanced understanding of its operation. All these categories, without exception, at present lack any formal education in management techniques, and have no real background in business studies which would allow them to comprehend the thought processes, problems, constraints and final objectives of the management hierarchy. This can only be overcome by the induction of information staff into management tasks at some time during their early industrial training, and the structuring of the information service to allow its staff to work closely with management personnel on project assignments. The information staff would then be able to move up their own career structure into more technical positions, while management staff would do the same, both having gained a real knowledge of the other's attitudes and capabilities. An early period of co-operation of this sort should lead to a better utilization of management skills, and understanding of management aims and decision-making by senior information staff, and a better appreciation of the importance of information work to the achievement of their objectives by senior management.

Information workers must face the fact that their future, and that of the services which they provide, is uncertain: their work is often seen by their employers as peripheral to the central interests of the organization, contributing little to its competitive and productive effort. The central thesis throughout this essay has been that information services must be planned and structured for change, and that they must be sensitive, flexible and responsive to all changes in corporate policy if they are to continue to provide a relevant and valuable service to their parent organization in a rapidly changing world. Self-confidence will be an essential quality in the manager of the information service of the future: self-confidence to control a dispersed service, broken down into small, fiercely individual units; self-confidence to jettison painfully acquired skills and collections of material, and move into new areas, acquiring new skills to handle new and intangible categories of data and information; and self-confidence to demand to work closely with senior management, and identify with their attitudes and objectives. Most vital of all, however, will be the self-confidence necessary for the information manager to continually question and interrogate his own ideas and attitudes, to identify new problems as they occur, adopt a new approach to deal successfully and completely with each and every one, and make absolutely certain that he is seen by his superiors to have succeeded in this task.

I have made no attempt to postulate a firm and universal pattern for the information service of the future; to do so would be to deny the principles of flexibility and adaptability already expounded: the only overriding principle which the service of the future must observe is the need to maintain a capability to react quickly and positively to changing circumstances, and to ensure that it is always performing a function which is both relevant and effective to the aim of the organization which it serves.

REFERENCES

1 MARSHALL, M. R. British industrial libraries before 1939. *J. Doc.*, 28 (2), 1972, p. 107–21.
2 GEE, R. D. Justification of information services. *Aslib Proc.*, 25 (10), 1973, p. 354–63.
3 *Eurodata survey*. London, PA Management Consultants, 1973.

The need for versatility in a small research library environment

Shirley Lowndes and
Ian Sharp

Science Research Council, Daresbury Laboratory

1. Introduction

THE NEED FOR change in the management and administration of libraries is now well recognized. Current thought seems to be largely devoted to systems analysis and streamlining of traditional library functions. Foskett,[1] however, puts forward a view that libraries 'are not closed and static systems, but must continually develop in relation to their environment, must be prepared to change the organization of their various parts in order to survive and fulfil the purpose for which they were created'. We endorse this view whilst stressing the need for the research library to be willing to expand its function to that of a system of communication as well as information. In fields of pure research which depend upon the rapid exchange of current knowledge it is necessary for an equal emphasis to be placed on both inward and outward communication. Providing the most useful service to scientific users within the confines of a stated number of staff and a restricted amount of money leads to a necessity for versatility in the staffing of such services.

2. Development of services

The Science Research Council's Daresbury Laboratory was established in 1965 to provide research facilities in experimental and theoretical high-energy physics for a permanent scientific staff and university users. In the last few years the scope of the laboratory had widened to include nuclear structure and synchrotron radiation physics. It houses a 5 GeV electron synchrotron (NINA) and in January 1974 construction commenced on a 30 MV Van de Graaff accelerator. A Synchrotron Radiation Facility at present uses synchrotron light from NINA for experimental purposes and a design study has recently been approved to provide an independent 2 GeV storage ring as a dedicated source of synchrotron radiation. The laboratory employs just over 500 people including, in addition to physicists, support staff who are specialists in electronics, computers and engineering as well as technicians, craftsmen and administrators. There are also approximately 120 university scientists involved in experimental work.

When a new laboratory is established it is essential that it should rapidly become known and its international reputation recognized. It is therefore of prime importance that good exchange relations are developed internationally and avenues of communication opened. It is equally important that results of work at the institute are presented in attractive, easily assimilated form and rapidly communicated in the same way. The international community of scientists depends upon

Aslib Proceedings, 27 (3), March 1975, p. 90–97. Printed in Great Britain

this exchange of ideas for the furtherance of research as a whole and for their specific projects in particular (Figure 1). In turn the institution's level of success is based on the achievements of its scientific programme in an international context.

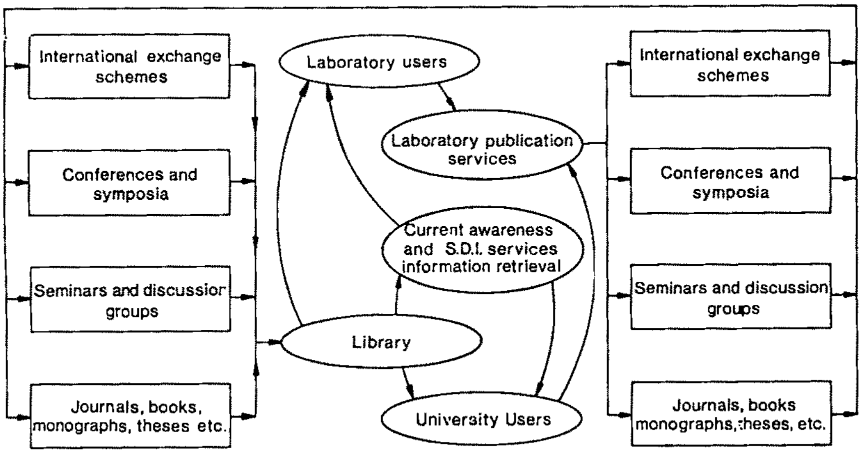

International exchange schemes
Conferences and symposia
Seminars and discussion groups
Journals, books, monographs, theses etc.
Laboratory users
Laboratory publication services
Current awareness and S.D.I. services information retrieval
Library
University Users
International exchange schemes
Conferences and symposia
Seminars and discussion groups
Journals, books monographs, theses, etc.

FIG. 1: *Communication pattern within the laboratory and in association with other national and international institutes.*

As most scientific personnel at the laboratory are of post-graduate or post-doctoral level, one of the first essentials was to provide the kind of library service necessary to academic research workers of this kind. A library was established for this purpose in 1965. The first task was to acquire stock and implement exchange relations with other institutes and universities. The information service was a natural development of the library service and by 1969 it had become necessary to employ a full-time information officer. The total staff then consisted of a librarian, assistant librarian, information officer and typist. The building phase of the 5 GeV accelerator was complete and experimental work had commenced.

Systems had been developed to ensure that all the necessary *incoming* information was received and disseminated but the problem of *outgoing* information had to be considered. Within the physics community the vehicle normally used for this purpose is the preprint, a rapidly produced version of an article which will eventually appear in a scientific journal. Expanded versions of such work, and definitive work not intended for publication in journals, are published as laboratory reports. Items intended for discussion, and for internal circulation only, are published as technical memoranda. It is these three categories which form the publication programme.

No editorial or printing facilities existed at the laboratory for production of this material and it was felt that this was a logical development of the library services—an extension to the communication pattern already being developed.

This was agreed with management, and a small offset-litho unit together with some ancillary equipment for printing was installed; a basic editorial service was provided which, after a short period in which confidence was established, became an accepted part of the library and information service.

The media of communication in science not only relies on the printed word. It is necessary for scientists to meet and discuss specific areas of current interest and importance and therefore meetings, seminars, symposia and conferences are an integral part of a scientific institute's life. An extension of library and information services to include scientific publishing had proved successful; management then asked if the service would be responsible for the organization of conferences and publishing of proceedings. A well-organized, smooth-running conference followed by rapidly produced, well-presented proceedings can play a significant part in helping to establish the international reputation of the institute. It was felt that this was another logical extension to the activities of the service and part of its responsibility for communication. At the time the demand for these extra services was quite low and would be a reasonable, extra load on available resources. The resulting benefits of close contacts with scientists from many other institutes, national and international, during the period of the conference would prove beneficial in the provision of information services in general. Close involvement with conference programmes dealing in depth with subjects of current interest would enhance the ability of the staff to provide information and anticipate demand.

The increased use of all services and particularly the report production facilities meant that extra staff became necessary. In 1973 a publications officer and permanent print-room operator were appointed, bringing the total number of staff to seven.

3. Problems

Convincing a scientist that his needs will be efficiently met by staff who are not subject specialists is difficult, in terms of supplying him with information, in editing and publishing his experimental results, and in advising on the form his conferences and meetings should take. The user will naturally doubt that his needs can be sufficiently interpreted and demands reasonably supplied. So this has to be a progressive process starting with the establishment of the library service. If one ensures that the selection of stock and provision of basic services is a co-operation between the staff and the physics community, that they are in fact entitled to take a large part in decisions, then the basis for close communication is established. In most research institutes it is recognized that to answer the specific needs of such a highly advanced scientific community, incorporating several distinctly different subject fields, would require a very large number of specialists. Furthermore, research progresses extremely quickly and only specialists who had been active in research as recently as a year before could hope to actively keep pace. However, our users increasingly recognized the ability of the library and information staff to co-operate with them; becoming progressively more experienced and having the ability to appreciate their problems whilst also having a knowledge of systems and their manipulation. This has proved an acceptable solution but is totally dependent on the maintenance of a close liaison with the physics community. It is important that the services do not attempt to tell scientists what they require, merely indicate ways in which their stated needs are best achieved, thus maintaining close communication and progressively building up the confidence of the user in the services.

4. The need for versatility

In his paper outlining the expansion pattern for library and information services, Arnold[2] shows increasing specialization to be the normal basis for development. Although this is generally recognized as the pattern for the expansion of services in large industrial organizations, or within authorities where generous funding is allowed for development, consider the case of the smaller service where the sanctioning of extra staff is virtually unobtainable and where financial support is carefully scrutinized.

By 1970 the diversification of the laboratory's subject interests to include the new fields of synchrotron radiation and nuclear structure meant a new and continually increasing demand on all aspects of the services. At the same time Government spending on science was restricted and the laboratory's complement was fixed at a firm 520. This meant that, at a time of critical development and expansion into new subject fields and increasing numbers of scientific users, no further staff could be allocated and funds would be limited. The problem was how to cope with increased use of all services and how, indeed, to continue to provide the right means of communication and dissemination of information both inside and outside the laboratory.

Extra staff with an increasing number of specialists would have been the normal pattern of development but this was impossible under the restrictions imposed. Underlying all this was the basic necessity for all services to be directly relevant to the research programme, to keep pace with it, to not only satisfy demand but anticipate future trends. Providing that the existing staff would be willing to undertake functions other than those for which they were strictly professionally qualified, and develop any skills which may be lacking, then it would be possible to provide the kind of services required. Figure 2 shows the degree of versatility required in order to make each function effective.

It was decided that the most rational approach would be to cut down the percentage of effort spent on input and to increase the amount of effort spent on productive output in terms of information and communication. We were aware that, in so doing, basic routines might suffer to some extent but the loss would be insignificant compared with the gain.

Arnold[2] also concluded that it is possible to satisfy the exploratory scientist in fringe fields only. Such scientists tend to become their own information officers and in the light of this it is probably better to concentrate on providing a first-class library service and effective avenues of communication, rather than pure information. This coupled with the practical difficulties outlined above provided the basis of the programme.

5. Methods

While it is not possible to expand here in depth on the measures that were necessary a few examples are given to illustrate the policy adopted.

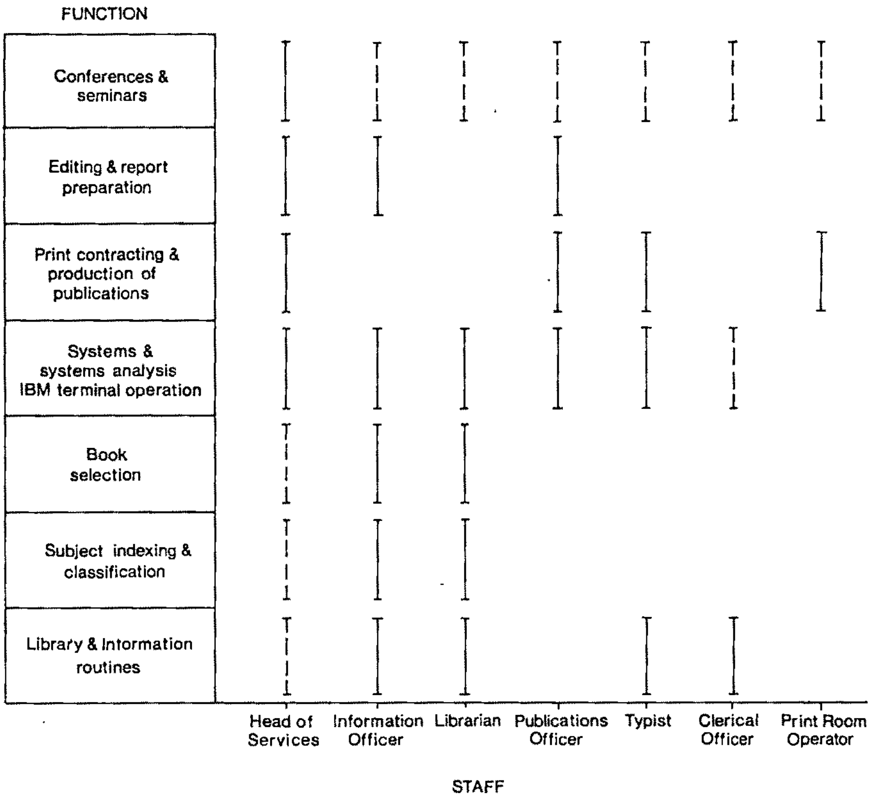

FUNCTION
Conferences & seminars
Editing & report preparation
Print contracting & production of publications
Systems & systems analysis IBM terminal operation
Book selection
Subject indexing & classification
Library & Information routines
Head of Services
Information Officer
Librarian
Publications Officer
Typist
Clerical Officer
Print Room Operator
STAFF

FIG. 2: *The degree of versatility required to make each function effective. Solid lines indicate primary responsibilities, dotted lines indicate secondary responsibilities.*

5.1. *Subject interests*

The problem of dissemination of information in high-energy physics proved less difficult than in other fields of physics. It is an expensive field of research relying on facilities which can produce the extremely high energies required for experimental work. Therefore, well-organized national laboratories exist, *e.g.* CERN at Geneva, Fermi National Accelerator Laboratory and Stanford Linear Accelerator Center (SLAC) in the USA, and DESY—the Deutsches Elektronen Synchrotron at Hamburg in West Germany. This is beneficial to us at Daresbury as a definite information structure had already been assessed and the information needs of high-energy physicists reviewed at the time when our service was in a formative stage, and one of our first priorities was to establish good relations with these institutes. Both DESY and SLAC had independently evolved retrieval schemes based on preprint collections and library stock at their laboratories, and in 1970 both of these were at pilot project stages. In Hamburg Dr K. Mellentin, Head of Scientific Information Services, had developed a mechanized SDI retrieval system[3,4] based on the DESY High Energy Physics

Index.[5] The DESY laboratory specialized in electron physics as did Daresbury and we were invited to submit a number of test profiles to help them evaluate their system.

The DESY SDI program is applied to all references classified by DESY Library for the High Energy Physics Index. Data include authors, title, origin and keywords which are supplied by subject specialists. Daresbury now has some forty-one profiles on file at DESY, and latterly the further facility of retrospective searching of the data base has been made available, providing a very effective coverage in this field. This project not only enables us to answer our current awareness needs for high-energy physics but also allows the use of the DESY Index on which it is based as a subject index to the library's preprint collection, thus saving valuable cataloguing and indexing time.

The utilization of these facilities meant that more attention could be paid to new subject fields which were not as well organized and, in some cases, to establishing services for groups of scientists where no specific information tools existed. For instance, physics utilizing synchrotron radiation posed a number of problems, primarily because of the breadth of the subject field—atomic, molecular and solid-state physics. Secondly, experimental work is not confined to the utilization of synchrotron light from electron synchrotrons, therefore the area of search is considerably widened and complicated. Thirdly, physicists in this field tend to work either individually or in small teams, not in major experimental collaborations, which may consist of as many as thirty scientists, as in high-energy physics.

Although an attempt had been made to assimilate material of interest to users at Los Alamos Scientific Laboratory[6] no comprehensive work existed. There was therefore a need for the compilation of a definitive bibliographic search tool which was continually updated and reissued. An international conference for synchrotron radiation users was held at the laboratory in January 1973 and the first compilation of the *Bibliography on Synchrotron Radiation*[7] was issued simultaneously allowing the first user reaction to be assessed.

The bibliography was originally based on an exhaustive retrospective search of the literature subsequently arranged under broad subject headings in collaboration with two scientists currently involved in research in this field. Reaction to the first edition proved favourable; subsequently it became possible to update, manipulate and rearrange textual data and to format, list and display the whole, or parts, of the bibliography as required, utilizing an IBM 2741 communications terminal linked to the Central IBM 370/165 computer via a Time Sharing Option (TSO).[8]

Work undertaken to update the bibliography provides a data-base for current awareness profiles for synchrotron radiation users and this is supplemented by a few profiles on the SDI service at DESY where mutual problems are involved.

During the design study period and the initial construction phase of the Nuclear Structure Facility (NSF) the problems of information retrieval were largely concerned with the design, components and materials of the Van de Graaff type of electrostatic generator. As the project at Daresbury is larger than anything previously built, both in terms of energy and physical size, then the problems are complex. Close liaison was undertaken with staff engaged on the project in order to familiarize information service staff with the range of subjects and to gauge future requirements. As the services had assisted with the production of the Design Study and proposed experimental programme reports a valuable insight into the range of topics covered had already been obtained. From these considerations effort was directed to a manual current awareness service which now has some 12 profiles in operation, and to establishing contacts with other institutes on a world-wide basis for the exchange of information.

In all new projects such as this, intensive retrospective searching is also necessary as new areas are investigated. The experimental utilization of the NSF is under more detailed discussion at present, and the problems of information retrieval for experimental nuclear physics is under active consideration. Discussions with scientific users and contact with major projects such as Oak Ridge National Laboratory, USA, and Chalk River Nuclear Laboratories in Canada form an important part of this evaluation. Furthermore nuclear structure as a subject field, although not as well organized as high-energy physics, does have existing retrieval schemes which may be utilized and these can, to some extent, be employed to reduce staff effort within the service whilst providing at least a supplementary service to those provided internally. As an experiment we are negotiating to undertake a number of group profiles under the INIS scheme as their coverage seems most suitable for our purposes.

5.2. Editorial practice

Editorial practice involves the basic principles of preparing text in the correct style for publication in a scientific journal or for submission to a conference, checking units and symbols and modifying text only where grammatical errors are obvious. Criticism of the scientific content is the responsibility of the scientific group leader. Standard rules for the preparation of the laboratory's own documents were prepared and routine methods of using other laboratory services for typing, drawings and photographic material prepared to an absolute standard were established. This has enabled a smooth-running production line to be evolved and has eliminated unnecessary effort.

As the editing and preparation of reports for printing increased, standard IBM/TSO EDIT and FORMAT programs could be used for the preparation of comprehensive documents for publication. Mailing lists, which are complex and constantly changing, could also be easily handled, resulting in a considerable easing of staff effort.

6. Conclusions

The initial need for versatility arose from the basic need to provide a service of communication and information to users with the staff effort available. The services were not expanded in an arbitrary fashion but to fulfil specific needs expressed by both the academic staff and laboratory management. Our function as we see it is to aid the laboratory research programme and to facilitate the rapid exchange of its results with other institutions and organizations both nationally and internationally.

It has been found that, fortunately, peak effort is not always required in the same section at the same time and an arrangement has been established whereby conferences and meetings are held at times of the year when the maximum amount of effort can be directed to them without detracting substantially from normal services. The utilization of external information retrieval systems, and the streamlining of internal systems, coupled with mechanization of some standard routines, has meant that valuable manpower can be released for a wider diversity of functions.

From experience it has been found that it is possible to expand into a 'communications' unit from a narrower concept of a library and information service by bringing out the latent skills of existing staff and without the need to employ specialists. The staff are, in general, enthusiastic about the opportunity to involve themselves in activities in which they may be largely unfamiliar. Both they and the service have benefited from involvement in activities of the laboratory research programme. Having the ability to switch from the dissemination of incoming information to the production and communication of new information encourages a close association between staff and users, and establishes a rapport which would be much more difficult to achieve on the basis of the provision of a strict library service alone. Consequently there is an expanded awareness of current and projected work which leads to a much more informed approach to the provision of services.

This policy of versatility may not be either successful or necessary in a large library and information service but for the smaller service with a staff ceiling of 10 or at the outside 15 it is a worthwhile consideration. While admitting that some routine activities in the housekeeping sense may suffer from diversification we suggest that this is a small price to pay for the quality and ability of the staff to understand the needs of our users and the intrinsic job satisfaction and stimulation received from feeling that the services have become an integral part of an active research programme. We feel that it has been proved at Daresbury that to be versatile is to be effective.

REFERENCES

1 FOSKETT, D. J. General systems theory and the organization of libraries. *La Rivista del' Informazione,* 4 (1–2), 1973 p. 13.

2 ARNOLD, D. V. An industrial information service: the effects of growth on its organization and administration. *Aslib Proc.* 16 (8) 1964, p. 234–45.

3 BRUNNSTEIN, K., HOLZHAUSEN, K. F. *and* MELLENTIN, K. The DESY high energy physics information system, *in Proc. Symp. on Handling of Nuclear Information, Vienna,* 16–20 *February* 1970. Vienna, International Atomic Energy Agency, 1970, STI/PUB/254, p. 111–26.

4 SKRONN, H.-J. Einkonzept zur Verarbeitung und Wiedergewinnung nicht-numerischer Daten durch Reschenan lagen (A concept for using a computer installation for processing and retrieving non-numerical data) in German. *Nach. f. Dok.* 21, 1970, p. 244.

5 *High Energy Physics Index.* Compiled at Deutsches Elektronen-Synchrotron, DESY, Hamburg (Leopoldshafen, Zentralstelle f. Atomkernenergie-Dokumentation) 26 issues per annum.

6 FURNISH, J., *compiler. Electron synchrotron radiation: a bibliography.* Los Alamos Scientific Laboratory report LA-4018, 1968.

7 MARR, G. V., MUNRO, I. H. *and* SHARP, J. C. C. *Synchrotron Radiation: a Bibliography.* Daresbury Laboratory Report, DNPL/R 24, 1972. 208 pp.

8 IBM System/360 Operating System: T.S.O. Data Utilities: COPY FORMAT, LIST, MERGE, User's guide and reference (Program product 5734 UTI) *4th ed.* White Plains, NY, IBM, 1972. 66 pp.

The costing of library systems

D. W. G. Clements

British Library Research and
Development Department

Introduction

LIBRARIES, LIKE OTHER organizations, are bodies trying to achieve certain objectives within set financial constraints and it is desirable that they operate as effectively as possible trying to achieve their objectives. Many libraries and information services have been developed on the understanding that they are 'a good thing' and this offers considerable scope for confusion about operating objectives and justification of the library's existence. It is therefore essential that the overall objectives of the library and information service are defined as far as possible and that progress towards these objectives is measured and monitored. The definition of objectives need not be difficult and indeed consideration of a 'Management by Objectives' approach could be of use in helping to define meaningful objectives. The hard core of any system that aims at measuring and monitoring progress towards stated objectives is costing. It is therefore essential that libraries are familiar with problems of costing and with the handling of financial information because it is of use in controlling day-to-day operations, in improving overall effectiveness, in ensuring an adequate and effective case is made out for the library or information budget and in planning for the future.

Background

Costing can be considered from two aspects, (i) routine costing to provide regular financial and management information and, (ii) special exercise costing to deal with particular questions such as whether to mechanize a given procedure or how much does it cost to process a new acquisition.

To enable library systems to be costed in a uniform and comparative manner, it is necessary to define a number of standards which must be used in all costing exercises in any organization. These standards include the following:

(i) a list of expense and revenue heads under which data must be recorded;
(ii) agreed methods of apportionment of costs on an arbitrary basis where exact analysis cannot be made economically, *e.g.* accommodation costs;
(iii) a standard list of library operations so that similar tasks can be compared;
(iv) an agreed list of units of measurement of output or service so that statistics are meaningful and comparable.

A standard list of expenditure and revenue heads under which data must be recorded is not difficult to produce and every organization will have its own accounting system which should provide the basis for such a list.

Aslib Proceedings, 27 (3), March 1975, p. 98–111. Printed in Great Britain

Certain costs obviously vary directly with a process and can easily be allocated to the correct part of the organization and/or the correct product or service. Other costs are more general and need to be arbitrarily assigned. For example, the costs of rent, rates, electricity, telephones etc. are generally known only for the organization and have to be arbitrarily assigned to various parts of the organization. Thus the rent and rates may be apportioned to departments on the basis of floor space, lighting by light points, heating by cubic capacity of a room, telephones by the number of phones, etc. Even after allocating direct costs and apportioning indirect costs to individual departments, there will still be considerable amounts of expenditure which may need to be spread over operating departments of an organization including the library or within the library departments. These charges include the cost of the administrative departments such as the finance section and personnel section. Such expenses are often loosely called overheads and can be apportioned on one of several arbitrary bases such as a percentage on direct labour costs, a percentage on total direct costs, etc. Geoffrey Ford in a report he has prepared for OSTI on the costing of library procedures[1] has suggested a basis for the apportionment of indirect costs.

When one comes down to comparative costing of library procedures it is useful to have a standard list of library operations so that similar tasks can be compared. The need for such a standard list has long been recognized. An early example was produced by the Library Association in 1963[2] and gave a descriptive list of the professional and non-professional duties in libraries. Aslib did further work in this field[3] and developed a procedural model to illustrate the use of various forms in performing the basic activities of a library. This provided an attempt to standardize the nomenclature of activities within a broad framework. Other work in this area by Aslib has built on and extended this earlier work.[4,5] Similarly, work carried out on Colorado Academic Libraries by Leonard and others[6] contained a list of standardized technical processing activities which is of interest. None of these, however, attained anything approaching a broad coverage of all library operations nor provided a means of describing them in any standard form. During late 1972 the British Library was experimenting in the use of diary survey techniques and developed a faceted list of tasks that was intended to enable an operation to be defined in a standard way facilitating comparison both within and between libraries. This list was reproduced in Geoffrey Ford's costing report mentioned above. It serves as a tentative basis for discussion on which a standard could be based though in the general administrative area further work needs to be done.

Finally, in any costing exercise it is necessary to relate costs to units of output or service provided. Some standard units of measurement of work completed or outputs produced are therefore needed if statistics are to be meaningful and comparable. This is an area in which further work needs to be done by libraries and a provisional list of units of measurement is given in the Appendix. It has not been developed very far but is intended to serve as a starting point from which a standard might evolve. It clearly needs to be tested in practice in libraries and its units measured up against the yardstick of practical experience and application. It illustrates, however, the need for a basic list of units of measurement so that comparison of data within one library or between libraries can be made.

Routine costing

Routine costing information comes from a cost accounting system that provides regular data for use by management. Many cost accounting systems exist and the system currently in use in the British Library will be used for illustration. Cost accounting involves the collection of costs for every job, process, service or unit, in order that suitably arranged data may be presented as a guide in the control of an organization. In the British Library a computer-based accounting system has been established and has followed the practice of amalgamating the cost accounts and financial accounts into a single co-ordinated system.

The first stage in the analysis of costs is to allocate expenditure, and revenue, to sections of an organization (cost centres) and produce sectional cost accounts that should be available for sectional management to plan and control their operations, especially if there are budgets with which to compare to actual expenditure. The extent to which an organization is divided into sections will be a matter of judgment but it is best to start with only a few major sections and to provide capacity for a more detailed breakdown in the light of experience. In the British Library, for example, ten major sections or cost divisions have been established (see below) and each of these major cost divisions can be subdivided into thirty sections on average though most of these have not as yet been utilized.

Cost Division
Board
Bibliographic Services
Lending Services
Central Administration and Research and Development Department
BL General
Reference Division General
Department of Printed Books
Department of Manuscripts
Department of Oriental Manuscripts and Printed Books
Science Reference Library

The second stage consists of analysing the sectional costs by activities and associating them with units of output or service. In library terms care needs to be taken when considering what outputs or services are provided. In the Bibliographic Services Division of the British Library, it is easy to identify the outputs as these are catalogues, bibliographies and other publications that are produced for internal use or for sale. In either case the costs need to be known and related to income where they are sold. In other parts of the British Library such as the Reference Services, outputs are generally units of service provided, often free, to users and one is trying to establish, in broad terms at least, the expenditure on the various types of service provided. Definition of outputs or services for these library activities is more difficult and the following is illustrative of one approach:

Provision of enquiry-based reference and information services
Provision of exhibition services
Provision of photo services (a) photocopying
  (b) microfilming
  (c) photography
Conservation of library holdings
Additions to stock

In practice invoices are received by divisional staff to check to ensure the goods or services have been supplied and authorize the invoices for payment. The staff then code the invoices prior to batching and forwarding to the finance section for entry into the computer and payment. For coding purposes pre-printed 'allocation slips' are attached to the invoices. Details of the VAT rate, VAT value and goods value have to be entered on the slip. The goods value of the invoice then has to be coded to show the type of expenditure and has to be allocated to the appropriate cost centre and analysed by the appropriate output or service with which it is associated. This coding operation is carried out by the divisional clerical staff and has caused no major difficulties once the system was familiar to them. The system also provides for a detailed analysis of book purchases while revenue is analysed on a similar basis to expenditure prior to entry into the computer.

The mini computer—a Molecular 18—is programmed so that as invoice details and cost codings are entered, they are checked and, if arithmetically correct, the computer prints out payable orders and schedules, automatically maintains the cost accounts and provides a separate VAT account. The only form of output is *via* a serial printer and all printed outputs can be obtained on demand as well as at regular monthly intervals. For audit purposes a daily audit trail is produced detailing all information fed into the mini computer.

Such a system, whether computer based or not, can produce cost accounts at several levels of detail, can maintain the standard financial accounts, and can be flexible enough to provide for further refinement in the analysis of costs. In order to make the best use of any cost accounting system it is necessary to have the full backing of top management and to discuss the proposed system fully with all levels of management concerned so as to ensure that the analyses provided suit their needs. It is also useful if the system provides for a regular comparison with a budget so that actual performance can be compared with that expected in monthly reviews of progress of expenditure. At one level, monthly cumulative figures can be compared with the annual budget to review progress and experience has to be used to judge whether the position seems satisfactory for that part of the financial year. Once figures have been obtained for several years, however, it is often possible to estimate monthly budgeted figures that take account of seasonal variations so that the comparison of actual and expected expenditure is more realistic. The British Library system has made provision for monthly and yearly budgeted figures to be incorporated for all individual cost centres and outputs. Initially only annual budgets will be used for comparison within the major cost divisions but given further experience and at least one year's complete figures, it will be possible to calculate monthly budgets that take account of seasonable fluctuations, though this need not be done for all cost centres nor for all expenditure heads.

Comparison of actual and expected performance in cost terms can clearly be of value and for management purposes some measure of units of output or service produced would help to relate costs to productivity and to 'unit costs', though this latter term cannot be used too strictly. The use of a system of budgetary control not only provides useful information on a routine basis but is also invaluable when preparing estimates for next year's operations and in establishing a good case for increases in the existing budget. Besides the usual starting point of the current budget plus allowances for price rises, the existence of data showing trends in work input and productivity rates help to quantify needs when planning for the next year or so and such supporting evidence can be invaluable when preparing a case for the library' budget. It is of course not only necessary to consider the growth of the budget due to existing operations, price rises and work throughputs but also to consider any major changes envisaged such as new services, changes in cataloguing policies, expansion of acquisitions, proposals to alter procedures using new equipment. All such changes must be quantified and supported by evidence, much of which will be derived from special costing exercises.

Special exercise costing

Special costing exercises are concerned with particular activities or groups of activities and will generally be concerned with costs of current operations and with estimated costs of alternative methods. In this, labour costs represent the major factor in total costs, generally accounting for about 50 per cent of the total recurrent costs as in the British Library and in the public library system in the UK. This section will therefore start by considering this aspect of costing.

All library activities are susceptible to measurement and costing, given time to collect the relevant data. For a technique to be practicable, it must be simple to operate, economical to run and able to produce reliable results that can be repeated at different times and/or different places. In considering the measurement of labour costs, some form of measurement is required to establish a time for an experienced worker to carry out a specified job at a defined level of performance. Traditional work study techniques have been developed in industry especially for measuring production processes, but can be applied to some library operations. The direct observation stopwatch-technique is not ideal for many clerical and most administrative tasks and cannot easily be applied to large numbers of staff in short periods of time. Another direct observation method is the use of activity sampling. This provides a percentage of time during which an activity occurs and enables more members of the staff to be studied. With clerical and administrative types of activities, it is, however, difficult to easily identify which tasks are being performed at a specific time since so much is based on thought processes. This technique is not easily applicable for many library activities though is suitable in certain circumstances.

An approach that can be used is based on diary recording by individuals and has been used in the past by various organizations. The Library Management Research Unit at Cambridge became particularly interested in this approach as a possible basis for a simple do-it-yourself technique that could be applied in any type of library easily and cheaply and produce reliable results. The principle of the Library Management Research Unit method is a simple standard recording technique based on diary recording by individuals of secondary tasks.[7] Any individual's job can generally be divided into main and other or secondary tasks and the aim is to identify the one main task on which most time is spent (this need not be the most important task) and then for the individual to record the amount of time he spends on his other tasks only. Tea and coffee breaks are not separately recorded in the diary. It is also necessary to have some measure of throughput, *i.e.* the number of units completed (*e.g.* items catalogued, enquiries answered, cards filed) though it is unimportant whether these units are recorded individually or for groups. It is then possible after a few weeks' recording to allocate the time spent by members of staff on each task and therefore to estimate the labour costs and compare this with some appropriate unit of work completed. This simple technique was tested and developed in part of the British Library to try to provide a standard tool that could be applied to give a broad analysis of staff costs in all parts of the organization.

Both for systems investigation within any one library and for comparison of costs between libraries it is necessary to have at least a brief description of the procedures used in each task (presented generally in the form of flow charts) and these descriptions or flow charts should follow standards such as those laid down in the National Computing Centre 'System Documentation Manual'. Besides a detailed description of individual tasks, it is necessary to have a standard list of tasks that can be used to classify the tasks recorded by the staff on their forms so that similar library operations can be compared. The detailed procedures used to perform each operation may differ from place to place or over time and would be identified under the flow charting when required, but the overriding need is the ability to compare primary operations such as 'preparation of catalogue entries'. Such a standard list has been mentioned previously in this paper. A further requirement to facilitate comparison of library operations is an agreed list of units of output or work completed and again the need is to concentrate on the most important and useful statistics for comparative purposes. Again the Appendix gives a provisional list of units of measurement that could be used for comparative purposes.

The following outline methodology was tested in the British Library and can be adopted in any study:

(i) Staff will be asked to complete a separate form for each day of the survey.
(ii) The form will record their name, grade, etc., on the top section.
(iii) The form will record their normal hours of work *e.g.* 9.00 am to 5.30 pm (from which is deducted 1 hour for lunch) plus any time worked outside normal hours.
(iv) All tasks should be recorded on separate lines on the form including sickness, leave, time off, etc. while any tasks carried out in paid overtime should be separately recorded at the bottom of the form. The

amount of time spent on each activity should be recorded and these times should add up to the total daily hours less time for lunch.

(v) Many people have a clearly defined main task which can account for about half or more of the day. In such cases they should enter the description of all tasks on the form but only record the time for the secondary tasks. The survey officer will later calculate the appropriate time for the main task when coding the forms.

(vi) Tea and coffee breaks do not need to be separately recorded but can be included in the time logged against the appropriate tasks.

(vii) Units of work completed will be required and can either be recorded on a group basis or individually depending on the existing statistics and the type of activity. Only for those tasks which have meaningful outputs will the units of work be recorded.

(viii) Activities carried out in paid overtime should be separately recorded so they can be charged for at overtime rates

(ix) The forms after completion should be passed to the survey officer for checking and coding according to coding tables and for calculating times for main tasks where only secondary tasks have had their times recorded. It was found generally useful to take each person's forms for one week at a time and to summarize the results on a clean form for punching and subsequent analysis. This helped to ensure that the times recorded checked with the hours of work and that the coding of tasks was meaningful and consistent.

Before any studies are initiated it is essential to hold preliminary discussions with the head of the institution or department concerned to explain the methodology, to indicate the results that can be obtained and to establish the areas to be surveyed and their priorities. Having agreed a broad plan of approach, any staff associations or unions should be informed of the proposed studies and then a general meeting should be held with all staff concerned to briefly explain what will be involved. Specific studies will be preceded by a three or four week preparation period during which the survey officer will obtain a general picture of the work of the units concerned and collect details of statistics currently collected on a group or individual basis, officially and unofficially. He will then meet each member of staff to explain the nature and purpose of the studies, to show how to complete the form, to identify the principal tasks carried out and how to record them, to identify where statistics of work completed need to be collected individually and to answer any queries. The data should be gathered for four weeks initially and could then be repeated for fortnightly periods at random times during the year if required. It is advisable to go round during the first day or two of data collection to answer any queries and to see if the forms are being completed correctly. It is always worth while carrying out a pilot study in a small part of an institution to gain experience in running the study and to see if any snags arise. This pilot need not be carried out for more than a week. It is also easier to start by considering processing departments, where jobs are more clear cut, rather than administrative departments. Finally, it was found that one person could explain the study to about sixty to seventy people in a week (*i.e.* instal the survey) and could successfully manage the study and analyse the results.

Once the basic data have been collected and analysed, certain summary tabulations can be prepared. One tabulation should present an analysis of the amount of time (and the appropriate cost) spent on the main library operations performed by the staff of the section together with a record of the number of units of work completed while a second tabulation should analyse the time spent on these operations by grades of staff.

The next stage consists of the preparation of a short report for management. This aims at concentrating attention on the main results and would be accompanied by copies of the summary tabulations.

A survey of an organization can, if required, be carried out in steps and each step analysed on the basis described above. At the end all the results can be brought together if required to prepare summary tabulations across the whole organization presenting detailed analyses and the comparison of data from section to section. This latter can prove of use especially where some tasks are carried out by staff from several sections of the organization. Public service work is a typical example of those jobs that are spread out over the organization, but it is surprising how many other tasks overlap over two or more sections.

The results of the studies present a detailed picture of the operations performed by staff and time spent on these, and thus the labour costs. It is useful to repeat such surveys for a two-week period once or twice a year to see if the pattern has changed or to see if there are seasonal variations. This is especially useful if changes in methods of working are to be installed to obtain measurements of performance before and after such changes. The broad picture of time spent on tasks and of rates of throughput are useful for day-to-day control in providing a better understanding of the operating conditions and in estimating for the effects of increased workloads, of backlogs, of staff absences, etc.

The results of the studies may also be useful in analysing the tasks being carried out by various grades and their possible reallocation. At a higher level an analysis of costs on a functional basis provides a truer representation of actual costs of operations and services, and this is invaluable in any system development work aimed at improving the effectiveness of current operations, in budgeting and forward planning and in the control and review of policy by management. The rapid rise in unit labour costs shows only too clearly the problem of labour-intensive operations in any service organization and the need to plan for the long term and to economize in the use of labour.

So far this section has concentrated on the measurement of labour costs which of course should be done not only in the processing and service parts of the library but in the administration sections as well. Besides labour costs, many other costs need to be considered and the existence of a standard list of expenditure heads serves as an *aide memoire* to ensure items are not missed out. The first stage is identify those direct costs that can easily be allocated to the correct part of the organization and this includes direct material costs such as catalogue cards, order forms and so on especially in mechanized systems, and other direct costs such as computer time, equipment costs, binding costs, consultancy charges, etc. Problems of spreading equipment costs over the life of the equipment need to be considered but fairly simple rules will do for most purposes. Indirect costs, as have already been discussed, cover on the one hand general items that need to be arbitrarily assigned, such as accommodation costs, while on the other hand include the cost of the administration departments which themselves need to be checked for their efficiency. These latter costs will need to be spread over operating departments if one is trying to estimate a selling price or the true cost of a service to the user. Government bodies can of course make use of the 'Ready Reckoner for Staff Costs' issued by the Civil Service Department to provide a quick estimate of overall costs based on staff costs plus allowances for overheads and accommodation. Though not accurate such ready reckoners can be useful for broader studies of forward estimates when no other detailed data exist.

Estimating the cost of proposed or alternative systems is fairly straightforward in principle and to a large extent the existence of costs of current operations provides a starting point. Before any alternative system can be costed the level of detail required must be decided, as often broad estimates will be sufficient to identify likely alternatives worthy of further consideration. Detailed costings will require a similar detailed level of knowledge about proposed alternative procedures with estimates of time required to complete the necessary tasks, equipment types, costs and speeds, material costs and so on. Again a standard list of expenditure heads serves to ensure that all aspects of costs have been covered though it may be possible to consider only marginal costs, *i.e.* those immediately affected, and to ignore general overheads especially if there are no changes in accommodation requirements. Changeover costs should not be ignored, especially if a change of system results in large stocks of redundant materials or in redundant equipment which is still in reasonable condition.

The use of automated systems in libraries is one of the most common proposals considered. Although automation costs are frequently divided into developments costs and operating costs it is not easy to separate them in practice and it is essential to cost the automated system over the whole life of the system so that the initial investment in a proposed new system is spread over several years. Experience has shown that staff costs over the life of a typical computer installation amount to roughly two-thirds, and equipment to about a quarter of the total expenditure, which clearly focuses attention on the main elements. The Civil Service Department has considerable experience in this field and it is not proposed to go into these questions in detail. In library terms conversion costs can be a major factor when large data files may need to be converted into machine-readable form. It was estimated by the National Libraries ADP Feasibility Study that the cost of converting the BM catalogue into machine-readable form would be about £600,000–800,000 exclusive of the cost of setting up an automated system for the British Library's processing operation. Considering that something like six million records are involved, however, it may well be that conversion costs would be much higher, by a factor of about four or five.

It should not, however, be forgotten that the costs of proposed systems need to be related not only to the existing systems—and any labour-intensive system is going to rise rapidly in cost due to salary increases—but also to other benefits that will result, and in the end it may well be that the new system is authorized not so much on grounds of cost savings, though this is desirable, but on the benefits to be expected for the new system which outweighs all other considerations.

Conclusion

This paper has briefly covered some problems of the costing of library systems and has concentrated on the one hand on routine cost-accounting systems for regular management information, and on the other hand on special exercise costing and on the analysis of labour costs since these form such a major part in library expenditure. Once costs are collected for management purposes they will prove to be invaluable and they will provide a basis on which many other longer-term studies can be started and will often allow consideration of the more sophisticated techniques of research to be applied in an organization. For the majority of cases the existence of costs will be found to provide a benefit for management on a day-to-day basis in controlling their organization and in planning for the future.

REFERENCES

1 FORD, G. *Library automation: guidelines to costing.* Lancaster University, March 1973. (Report prepared for OSTI.)

2 *Professional and non-professional duties in libraries.* A descriptive list compiled by a sub-committee of the Membership Committee of the Library Association. The Library Association, 1963.

3 THOMAS, P. A. *A procedural model for the use of bibliograghaphic records in Libraries.* Aslib (Occasional Publication no. 4), 1970.

4 THOMAS, P. A. *Task analysis of library operations.* Aslib (Occasional Publication no. 8), 1971.

5 THOMAS, P. A., *and* WARD, V. A. *An analysis of managerial activities in libraries.* Aslib (Occasional Publication no. 14), 1974.

6 LEONARD, C. E. *and others. Centralised book processing: a feasibility study based on Colorado academic libraries.* Scarecrow Press, 1969.

7 SMITH, G. C. K. *and* SCHOFIELD, J. L. Administrative Effectiveness: times and costs of library operations. *Journal of Librarianship,* 3 (4), 1971, p. 245–66.

APPENDIX

Units of Measurement

DATA COLLECTED REGULARLY	DATA COLLECTED AS REQUIRED
A. New inputs to the library	
1. *Items ordered*	
1.1. Number of Titles Ordered	(1) Proportion selected but not ordered
(If possible count under the following headings)	(2) Amount of second-hand material ordered
(i) by purchase	(3) Proportion of orders needing to be chased or hastened
(ii) by exchange	(4) Performance of various sources of supply
(iii) by donation	
(iv) by legal deposit	

DATA COLLECTED REGULARLY	DATA COLLECTED AS REQUIRED
2. *Items received*	
2.1. Current Serial Titles (excluding monograph series) Count the number of current serial titles received, counting each title once only (*i.e.* exclude duplicate copies)—this means counting bibliographic titles and not parts	(1) Number of new titles taken (2) Number of titles ceasing publication (3) Number of separate parts to be registered/recorded (4) Number of modifications required to existing records, *e.g.* change of title, change of price, etc.
2.2. Number of Patents received (i) UK Patents (ii) Non-UK Patents	
2.3. Printed Materials (monographs, etc. excluding current serial titles, patents, printed maps, musical scores) (If possible count under the following headings) (Count by volumes or units) (i) by purchase (ii) by exchange (iii) by donation (iv) by legal deposit	*Applicable to all types of items received* (1) Number and type of items ordered but not received (2) If appropriate, other types of material received should also be broken down by (i) purchase, (ii) exchange, (iii) donation and (iv) legal deposit
2.4. Printed Maps (Count by number of sheets)	
2.5. Music (Count by number of separate scores)	
2.6. Manuscript Material (Includes full-size copies if not commercially published but excludes microform copies) (Count by number of units to be catalogued)	
2.7. Microforms (i) Microfilms by number of rolls (A standard roll is 30 metres long, approx. 100 ft.; 60 metre lengths count as 2 rolls, etc.) (ii) Other Microforms (Count by the number of physical units, e.g. sheets of microfiche, number of microcards)	
B. Processing outputs of the library	
1. *Stamping* (Stamping of newly acquired material with appropriate library ownership and/or date-stamp)	(1) Number of items stamped (2) Delay between receipt of item by library and shelving (and date-stamping if appropriate)
2. *Item streaming* (Sorting newly acquired material and routing according to processing steps required, *e.g.* type and level of cataloguing, need for classification, need for binding, etc.)	(1) Proportion of items received undergoing each of the processing steps available (2) Delays between receipt of items, completion of each processing step and final shelving
3. *Cataloguing and subject work* 3.1. Number of separate titles catalogued; and number of catalogue entries prepared. (If possible count under the following headings)	(1) Level of cataloguing used and amount and type of material going to each level (2) Number of entries revised (3) Number of existing entries in the catalogue altered/amended (4) Amount of modification and revision

DATA COLLECTED REGULARLY	DATA COLLECTED AS REQUIRED
(i) monographs (ii) new serial titles (iii) individual serial articles (iv) other material	needed to the authority files (5) Amount of time required for authority checking during preparation of catalogue entries
3.2. Number of separate titles subject analysed and/or indexed; number of separate titles classified; and number of subject entries prepared	(1) Type and level of subject work and amount and type of material going to each (2) Number of entries revised (3) Number of existing entries altered/amended
4. *Production of catalogue and other bibliographic tools*	(1) Delays between receipt of final entries and production of finished products (2) Proportion of entries produced by each of the processes used (3) Amount of machine time lost
4.1. Number of records typed and/or keyboarded	
4.2. Number of entries proof-read prior to final production	
4.3. Number of catalogue cards produced	
4.4. Number of catalogue entries printed or produced (excluding catalogue cards). Please indicate whether produced in printed form, microfilm, COM, etc.	
4.5. Number of other bibliographic tools produced (please specify)	
5. *Binding, labelling, boxing, etc.*	
5.1. Binding Control (Scheduling, etc. of items to be sent to the binders) (Count by number of physical units bound)	(1) Amount and type of material to be bound and rebound (2) Delays in binding (3) Proportion of items received from binders requiring further binding work
5.2. Shelf location system	(1) Type of shelf location system used, number of units dealt with
5.3. Labelling	(1) Type of labelling system used, number of physical units labelled
5.4. Boxing (Preparation of boxes for serial parts, loose material, etc.)	(1) Number of boxes prepared (2) Number of physical units boxed
5.5. Covering (Covering of books, etc. with protective jackets, etc.)	(1) Methods used and quantities dealt with
5.6. Filing and Shelving	(1) Number of physical units of new acquisitions shelved (2) Number of units of stock withdrawn for discarding (3) Number of units of stock replaced due to wear, outdated editions, etc. (4) Amount of tidying of material on open access shelves. Number of items on open shelves in wrong position (5) Number of catalogue cards filed (6) Number of existing catalogue entries replaced due to wear, damage, etc. (7) Number of existing catalogue entries withdrawn

DATA COLLECTED REGULARLY	DATA COLLECTED AS REQUIRED
C. Service functions of the library	
1. *Reception/screening of readers*	(1) Number of applications for readers' tickets dealt with
2. *Book application and reservation* (Concerned with readers' applications for books stored in closed access) 2.1. Number of applications received 2.2. Number of volumes or units reserved 2.3. Number of requests not satisfied	(1) Analysis of distribution of numbers of applications made during each day and of seasonal fluctuations (2) Analysis of number of volumes reserved per reader and periods of reservation (3) Analysis of requests not satisfied and reasons (4) Analysis of reader failure in locating material in the catalogue
3. *Book supply* (Location and retrieval of material stored in closed access) 3.1. Number of volumes or units requested 3.2. Number of volumes or units supplied 3.3. Number of requests not supplied 3.4. Number of requests taking longer than '*x*' minutes to supply	(1) Analysis of length of delays in delivery and their causes (2) Analysis of type, age of publication and subject of items requested (3) Analysis of reasons for requests not being satisfied (4) Analysis of number and size of volumes requested per reader
4. *Loan services*	
4.1. Loans to readers for use outside the library (i) Number of volumes lent (ii) Number of items reserved	(1) Analysis of loan requests by type, age of publication and subject (2) Number of volumes overdue (3) Number of reservations satisfied and length of delays (4) Distribution of issues during the day showing peaks of use
4.2. Lending to other libraries (i) Number of requests received (ii) Number of requests satisfied (iii) Delays in supply	(1) Originl items lent to libraries in UK and overseas (2) Number of photo- or other copies issued to libraries in UK and overseas (3) Analysis of type, age of publication and subject of requests received and sources of requests and analysis of unsatisfied requests
4.3. Circulation of literature to members of own organisation	(1) Number of titles circulated and number of people on lists for each title
4.4. Borowing from other libraries (i) Number of items requested (ii) Number of items received	(1) Analysis of items requested (2) Analysis of sources of supply (3) Analysis of speed of supply
4.5. Location services (Supply of locations of items not held in stock) (i) Number of requests received (ii) Number of requests satisfied (iii) Delays in supply	(1) Source of requests and source of supply (2) Analysis of type, age of publication and subject of requests received, satisfied and unsatisfied
5. *Information services*	
5.1. Number of enquiries received and number satisfied broken down by (i) readers' enquiries (ii) telephone enquiries (iii) postal enquiries (iv) telex enquiries	(1) Analysis of number and type of requests received and satisfied (2) Analysis of requests unsatisfied (3) Amount of time required to answer requests and material used to supply answer

DATA COLLECTED REGULARLY	DATA COLLECTED AS REQUIRED
5.2. Compilation of bibliographies, reading lists, etc.	(1) Number of bibliographies, reading lists, etc. compiled. Frequency of duplicate requests. Amount of time required to prepare these items.
5.3. Other services (e.g. translations, exhibitions, educational services, etc.)	(1) Analysis of requests for each type of service against demand, costs and charges
6. *Reprographic services*	
6.1. Photocopying (see also 4.2. above under loan services) (i) Number of requests received and satisfied and whether requests received by post or from readers in the library (ii) Number of sheets produced	(1) Analysis of type, age of publication and subject of requests received, satisfied and unsatisfied (2) Analysis of size of orders (3) Analysis of speed of supply (4) Analysis of costs and charges
6.2. Microfilming (i) Number of requests received and satisfied (ii) Number of frames produced	(1) Analysis of type, age of publication and subject of requests received, satisfied and unsatisfied (2) Analysis of size of orders (3) Analysis of speed of supply (4) Analysis of costs and charges
6.3. Other copying and photographic services (i) Number of requests received and satisfied (ii) Number of units produced (*e.g.* frames, prints, etc.)	(1) Analysis of type, age of publication and subject of requests received, satisfied and unsatisfied (2) Analysis of size of orders (3) Analysis of speed of supply (4) Analysis of costs and charges

Architects' wants and needs for information, demonstrated through a university-based information service

Christine Snow

Information Consultant, MANDIX

A INTRODUCTION

1. Background

ARCHITECTS' REQUIREMENTS FOR information, related both to their jobs and to the information itself, are little studied, as shown by the few user requirement surveys in this discipline.[1–8] Goodey and Matthews,[3] the Department of the Environment,[4] the RIBA[9] and others have described some of the habits and preferences of architects for information. These may be summarized as:

- i Architects prefer the easiest route to information, through colleagues and manufacturers' representatives.
- ii Architects depend on trade literature as a major information source.
- iii Few architects' offices have a well-stocked library and an experienced/qualified librarian.
- iv There is a poor attitude to information seeking at senior management level.
- v Architects read little and they do not like jargon or over-technical literature.

It might be supposed therefore, that information is offered to architects in a form tailored at least to the requirements identified at present.

Most information services offer a range of published information (journals, technical notes, abstracts, etc.), aided by classification and indexing systems (UDC, SfB, Keywords). Some offer an enquiry service to supplement their published information. There are however a number of difficulties associated with these information communication systems for architects. First, there is often duplication—for example, technical 'handbooks' produced by one journal may be duplicated by specialist organizations in their own technical notes, or by other journals; there are a number of bibliography and abstract services covering and overlapping in the same field of interest. This means that the architect may find, after consulting a number of sources, that he has read the same information presented in different places. The result is that he has probably spent a great deal of highly paid professional time in searching and reading. In addition, the 'opportunity cost' (loss of time for alternative tasks) must be added to this.

The second problem with architectural information is in the number of classification and indexing systems used; some of these are quite complicated to the naïve user. For example, UDC can produce rather complex numbers,

Aslib Proceedings, 27 (3), March 1975, p. 112–123. Printed in Great Britain

especially in indexing architectural technical information. SfB is a system produced especially for construction industry information and much information produced for architects is pre-classified by this system. SfB has been amended by the RIBA[10] into a form known as CI/SfB. In addition to these two systems, some documents are indexed using keywords; these may be based on the Construction Industry Thesaurus[11] or on some other system, for example the Building Research Station Keyword systems. UDC, SfB and Keywords all depend upon different underlying logical structures. Apart from this academic consideration, the time and intellectual problems for the architect in learning a variety of systems are of great importance.

A third difficulty in architectural information is that information is 'split' into technical and product information. Briefly, product information concerns details of products and services available for specification, and technical information concerns all physical problems to do with building design and construction. Technical information is naturally intermeshed with product information but the two are traditionally treated somewhat separately. Few information services offer a comprehensive cover of data, information, advice and action for the whole range of information in the building industry. Examples of services approximating to this ideal include the Building Research Station Advisory Service[12] and the Building Centres.[13] Thus it is usually time-consuming for an architect to obtain a piece of information he needs; in short, information services in general do not cater for the requirements, habits and preferences of architects. As a result, there exists an 'information problem' in architecture, and much has been written about it.[1,2,4] Some of the evidence for the 'information problem' is provided directly by the few user-requirement studies carried out in the construction industry as compared with those in other areas,[1,2,4] and indirectly from reports of building failures,[14,15,16] litigation against architects[15,18] and increases in professional indemnity insurance premiums.[19] Where the reported building failures are examined, it would appear that many failures might have been averted if information, which was available, had been used.[20-22] Why then was it not used? It would appear that the information was available largely in the *published form*, which would suggest that the information problem is based on a *publications problem*. The recognition of this is shown in the efforts of a number of organizations to improve publications. Examples are the recently published British Standard,[23] the Data Co-ordination Report of the Directorate of Building Development of the DoE[24,25] the development of SfB by the RIBA, the study of the presentation of research results by York University and the Building Research Station.[3] However, the success of these proposals depends upon a number of assumptions, which are based on the ability of the user to find a piece of information, read it, assimilate and act upon it. Any effort to improve publications must therefore assume:

i The suitability of publications as a medium for information communication.

ii The organization of information should be determined by the producers and marketers of that information (shown indirectly from the few user requirements studies).

iii The level of training and ability of information users, *i.e.* architects, to manipulate information retrieval systems, *e.g.* indexes under classification systems, unaided.

It is the author's contention that the efficient use of information will not be effected while the requirements of users go largely uninvestigated and while the user is inundated with increasing numbers of publications and systems for information retrieval that the user himself must have the time and ability to operate. If information is needed to improve the quality of problem solving and decision taking by users of that information, then it is important to investigate the relationship of the user, his job and his information.

The aims of a project, recently completed in the Welsh School of Architecture, UWIST,[26] were to determine:

a The nature and purpose of information and information systems generally and in particular in architecture.
b The architect's work pattern and his habits and preferences in information seeking, *i.e.* his present information activities.
c The architect's wants and needs as determined from his reactions to an information service based in a University School of Architecture Research and Development unit.
d How to improve the use of research results by architectural practitioners.

This paper sets out to describe the reasons for selection of a live information service to study user requirements, the problems of setting up and running the service, the results of and the implications arising from, the use of the service by practising architects.

B METHOD

1. Selection of 'live test' method

Studies on the information requirements of users are important in the operation and improvement of any information service. However, there are a number of difficulties: the problems arising from user requirement studies have been summarized by, amongst others, Hanson,[27] who says: 'Real needs are extremely difficult to explore, and in practice most of the investigations have been of users' actions, and of their expressed demands, which is not quite the same thing.' Line[28] warns: 'User studies are of little predictive value . . . what people do is inevitably constrained by what there is: the present range of choices is limited.' In addition, because of the many different studies undertaken and the wide variety of methods used in those studies it is not possible to correlate one set of results with another.

In the light of the observations of the authors quoted, it was decided that the examination of architects' information requirements should be a practical aid of information about the production communication and feedback of information from and between sources and users. With this in mind, the response was measured to an actual information service, of a type not generally found for use by architects.[29,30] This took the form of a telephone inquiry service, supported by field visits. The service was preceded and followed up by interviews and questionnaires. Initial reaction to the idea of the service, architects' actual use of it, and feedback comments on the service, all produced evidence of architects' habits, preferences, wants and needs for information. Thus results were obtained from a known rather than a hypothetical information service. This type of study was advocated by May.[31]

2. Setting up and running a pilot information service

The decision to obtain results through the use of questionnaires and the operation of a live information service, brought with it the problems encountered in the marketing of any product or service.

First, the definition of need for a new approach—these problems of information in architecture have been described above. Second, the broad strategy was defined *i.e.* the methods for studying the needs, wants etc., were more deeply defined. Third, the initial market research with questionnaires discovered habits and preferences and sowed the seeds for the operation of the information service. Fourth, the actual product, the information service, was tested in a controlled, live, and representative population (test market). Finally the reaction to the service was recorded. There should be a further step, in a true market situation, of taking the decision to expand, modify or reject the product, but this was outside the context of the project.

The methods used in the service were influenced by the results of and guides to information services, which are well documented.[32,33] The setting up and operating of the information service in the Welsh School of Architecture is described in more detail by Snow and O'Sullivan.[34] The pilot information service was begun in June 1972 and continued until June 1973. The period of the analysis was from October 1972 to June 1973 when a small but increasing number of questions was received.

C RESULTS AND ANALYSIS

1. General

The analysis of the results of the service falls into two distinct parts:

i An analysis of the independent variables and the implications of these.
ii An analysis of the dependent variables characterizing the architects' use of the service.

The analysis of independent variables is based on the actual use of the service, as seen by the author, in terms of:

a Numbers and subject of questions asked.
b The type of information required.
c The characteristics of the questioner and his practice.
d The preferred medium for asking and answering questions.
e The effect the information might have on the architect's level of training. (*i.e.* the 'quality' of the question reflecting the problem perception of the questioner).

The analysis of the dependent variables indicated the users' own analysis of the service, as collected through free depth interviews and structured, self-administered questionnaires. These variables included:

a satisfaction of user.
b use of other information sources.
c speed of reply.
d correctness of answer.
e preferred form of service.

2. The independent variables—an analysis and discussion of questions asked of the information service

The results of the service were analysed under the following headings:

i short- or long-term effect on architect's training.
ii job type of questioner.
iii practice type of questioner.
iv information type required by questioner.
v preferred medium for asking and answering questions.

The details of the results are given by Snow.[26] Eighty-seven out of a total of 120 questions were prepared for analysis (representing 64 questioners).

2.1. Effect on architects' training

The results showed that information was required for immediate problems on the whole (91 per cent) in the form of a quick solution. This is the usual function of an information service. However, a number of requests were for information to solve complex problems involving either the provision of solutions, or the provision of the correct information and an explanation. This kind of information has a larger, educational/training content than the 'quick fix' type, and is therefore a method of keeping up to date and learning about new techniques. There is no reason why this type of problem should not concern an information service. If experts are provided as a part of the medium of the information system, then there will be instantly available sources of technical information for superficial training purposes at different levels to suit the abilities and needs of the questioner and his office.

2.2. Job types of question-askers

The majority (86 per cent) of question-askers were designers. McBinney[35] has shown that the use of special information services declines with increasing salary: when the profile of question-askers was investigated it was seen that the majority were in the medium to medium/low salary range. All this means in the context of short-term information problems is that the right people—the designers—were asking for information for immediate design problems. However, for the long-term problems of keeping up to date and learning new skills the implications are more serious. The principal is usually the chief decision-taker about office policy; if he does not use special information services, his stock of theoretical knowledge will arguably decrease, making him less able to take good decisions and be aware of the problems of his staff.

/

2.3. *Organizational type of question-askers*

There were slightly more questions asked from public rather than private offices (2.8:2.3).

In the private sector, the majority (95 per cent) of question-askers were from the small to medium-size range (2–5 to 11–30 staff). This is to be expected from the structure of the office population in South Wales, where the small and the medium office predominates. In the public sector question-askers were mostly from the local authorities (90 per cent): this may be because government departments have access to large, free information services, therefore will not tend to ask questions outside those. Local authorities on the other hand tended to have inadequate information facilities as had most private practices investigated.

2.4. *Information type of questions*

2.4.1. *Manufacturers' (product) information*

The high number (35 per cent) of requests for the simplest of manufacturers' information suggests three things:

—that practice libraries are inadequate in terms of contents, of employment of librarians, or both: research has shown the inadequacies of architectural office libraries; [4,9,26]
—that common guides to manufacturers' information are not well known: if guides to manufacturers' information are not known then this may be a marketing fault of the producers;
—that manufacturers' publications are inadequate in terms of the content and presentation of the information: the inadequacies of manufacturers' publications, as shown by Bullivant[2] and the Department of the Environment,[24] is improving all the time and there is now a British Standard,[23] to guide the production of such publications.

2.4.2. *Simple technical information*

The majority (42 per cent) of questions were for this category of information. The majority of these requests were for details of publications, *e.g.* a document on programming and progressing. This result confirms the work of Paisley and Parker,[36] Slater[37] *et al.* and Myers,[38] who showed the need for documented information in the decision-making process. Whether the content was read, understood and applied could not be tested.

2.4.3. *Complex technical information and failures*

The majority of questioners asking about complex technical information and failures discussed their problem with a subject specialist. This reflects the problems of assimilating solutions to complex problems from the literature: a specialist may help in the information transfer process, and assist the training of the architect in the use of relevant information.

2.5. *Subjects of questions asked*

The most significant percentages of questions were about:

Sound and vibration control (13 per cent)
Building types in general (16 per cent)

The building fabric in general (27 per cent)
Building services (10 per cent)

The largest percentage was for problems concerned with the building fabric: this is to be expected because of the large numbers of enquiries for manufacturers' information. These subject types are too varied and over too small a population to draw any significant conclusions about the subject wants and needs of architects.

3. The dependent variables and analysis of the users' response to the service

3.1. General

The dependent variables were collected through the medium of unstructured, free-depth interviews and structured questionnaires. These variables indicated the satisfaction of the user with the information service. Unstructured free-depth interviews were conducted about halfway through the operation of the service.

The basis of the interview was a reiteration of the nature and aims of the project. Each person was given a list, containing examples of questions asked during the course of the project; discussion during the interview was generated either spontaneously or after consulting the sheet. Comments were recorded and afterwards analysed, grouped and coded by inspection. The final survey was carried out in May 1973. It took the form of a postal questionnaire sent to all those persons who had used the service. The objective of this final questionnaire was to test the users' perception of the service and to record their comments about the usefulness and scope of the service in general.

3.2. Results of feedback interviews

The mid-term interviews proved to be essential in giving feedback on users' reactions to the service. In addition the interviews revealed a lack of understanding or misconceptions about the service which were corrected immediately. Thirdly, some of the suggestions put forward in the interviews indicated very traditional ideas about information and information services. Finally, the social aspects of meeting the users and potential users have some importance. This is because the user can identify his problems with a person or people with whom he is acquainted. It depends on the efforts of the fieldworker in appearing helpful and competent; this will in turn affect the attitudes of the architect towards seeking information.

3.3. Results of the final survey

The final survey questionnaire was designed to show the satisfaction of the user with the experimental service, in terms of speed of reply, correctness and adequacy of the information supplied. In addition, the user was asked to select a 'preferred form' of information service and to comment generally on the service.

The questionnaire also showed the effectiveness of marketing of the service, and exposed failures of other information services (in-house and externally available). The details of the questionnaire are given by Snow:[26] the results and analysis are shown below.

3.3.1. User Opinions

Opinions about replies to individual questions. Most users (95 per cent) were satisfied that their answers were received quickly enough and that the answer was correct. However just over half the users said that the information was full or adequate. This is not on the surface a very good performance by the information service; but adequacy depends on both the producer and the ability of the user to perceive problems, *i.e.* he may have his problem, and therefore his question, wrong in the first instance. The information service can improve this situation by interrogating and probing the background.

Opinions about the service in general. Most users (67 per cent) selected 'personal service' as one of the useful features of the WSA Information Service. Of the more specific features of the service, obtaining references was selected by the majority. Finding the right piece of information in the right publication can save the user time in searching and the opportunity cost of being able to pursue other tasks.

'Getting product information' was 19 per cent of features selected and was also prominent in the comments recorded. This is not surprising when the history of information in architecture is studied. What is surprising is that users should consider another product information service appropriate. This suggests that the services available are badly marketed or inadequate (assuming that the fault lies with those services).

3.3.2. Marketing of information services

Effectiveness of advertising. Most users (84 per cent) had heard of the service through visits or newsletters but the interviews showed that some of the potential users had not heard of it at all. It is not enough to approach new users through, for example, a letter to the principal, or even by direct mail to each architect. Attitudes to direct mail (referred to rather rudely by interviewees) show that this kind of method has severe limitations. The majority of users of the WSA service had heard of it through face to face meetings and discussion.

The use of information sources. The results show that, for many (84 per cent) of the questions asked, the user had tried another source of information before trying the WSA Information Service. The majority (72 per cent) of these sources was the architects' own in-house information services. This again reinforces the view that architectural practice libraries are inadequate. In addition most users had tried only one other information source beforehand: this suggests that the architect is not aware of the variety of information sources that exist, and the results confirm and reinforce anecdotal evidence collected through initial and intermediate interviews that architects' information is centred round product data and the systems designed to organize this. It would be interesting to know how the architect takes decisions when he does not find information he needs.

3.4. Summary of results

The interviews and survey showed the limitations of thinking about information in the architectural profession: 'Habits of information seeking built up over a period of years may be relatively rigid'.[36] A further problem may be that 'real needs may go unexpressed if users consider them unrealistic (*i.e.* not capable of being realized by existing systems)'.[36] Two types of user may be identified: the more rigidly thinking user and those who observe information problems and suggest new solutions for these. The remarkable response to the in-field marketing illustrates the importance of this in all types of library/information services. A user can be led to understanding and expressing his problems through discussion and example. However, there is prejudice against non-architect subject specialists from architects.

D IMPLICATIONS

The size of this project, the numbers taking part and the amount of data collected, are too small to make extrapolations and predictions from the data. However, a number of discussion points and possible implications for architectural information arise.

1. Information and people

A programme of discovering users' reactions and needs, as indicated above, may need a larger investment in *people* than is at present made. This is because a continuing programme of monitoring users requires not only staff to process the data, but also more people 'in the field', to create closer contacts with users and encourage question asking. However, this does not mean that investment in information technology should be or could be abandoned. Every information service needs an extensive and deep information/data base, for manipulation by the service for users' requests, but information 'people' should always be transposed between the data bank and its machinery, and the user.

There are two types of person who can be of use in information services.

1.1. the information specialist

This term, used loosely, may refer to a library assistant in a small architectural library or the information officer of a national information service. This person can obtain a knowledge of problems related to the questioner and his work pattern. In addition, because of his training and experience, he can effectively manipulate a variety of information sources and channels of communication, on behalf of the questioner. He can help improve question asking and problem perception of the user.

1.2. the subject specialist

The subject specialist will cover expertise in a variety of subjects, both common and uncommon, so that all foreseeable problems are provided for. This person may be able to offer explanations of problems, and show how they might be solved. In addition, he should be able to provide a level of explanation according to the level of ability of the questioner, but must prove himself able to relate to the practical problems of the architect.

2. Information, decision making and education

Information retrieval should be viewed as an essential part of the decision-making process, *i.e.* the design/build process in architecture. To this end, information retrieval as part of the decision-making process should be implicit in the education of architects and associated professions. Thus the early parts of any architectural school project might revolve around the school's information and library service and librarian, as well as the drawing board. In this way, architects may begin to view information and information officers as an essential part of the problem-solving process, thus generating new pressure groups within architectural practices, to improve information retrieval facilities there. This should help to improve the quality of information seeking and decision making. Similarly, some instruction in information seeking in the broad sense should occur continuously throughout the practice of architecture.

The improvement of question asking is not merely a function of the information officer; it should also be a consequence of the educational processes. Curiosity and problem evaluation are implicit in the whole process of education, information retrieval and decision making. If information communication is seen as an educational process, then the widely differing types and needs of users should be provided for.

An information service can be an 'educational programme' in the following ways:

a by providing for low levels of need, *i.e.* where the inquirer wants a packaged answer.

b by monitoring subjects and levels of need requiring intensive and tailored training courses.

c by using the knowledge of office structure and work pattern to gear courses more personally to users (the concept of selective dissemination of information). This may be done by 'in-house' training, so that continuing education becomes part of the normal work pattern.

Such an information service would give the opportunity for an observer–participant study of the architectural profession in terms of management structures, decision-making points, specialisms of the office, continuing education, in-house information retrieval, work patterns and personalities.

3. Concluding remarks

The information service described in this paper can be viewed not only as an information co-ordinating service but also as an educative/training device. By encouraging question asking and by offering solutions as well as further information sources, the information service becomes part of a total research-practice-training unit such as that described by Hillier and Leaman[39] and Beckett.[40] Although such a 'clinical unit' was not achieved during the research project described, some of the problems and some of the solutions were exposed and tested.

REFERENCES

1 BULLIVANT, D. Can we survive the information explosion? *Architects' Journal,* **127** (3303), 1959, p. 504–21.

2 BULLIVANT, D. The problem of information before the architectural profession. *RIBA Journal,* 75 (12), 1968, 553–9.

3 GOODEY, J. *and* MATTHEW, K. *Architects and Information.* Research Paper 1, Institute of Advanced Architectural Studies University of York, January 1971.

4 DOE, *The use of information in the construction industry—a study of twenty-five firms.* DoE R&D Report, 1968.

5 ROBERTS, M. The use of periodicals in architecture. *CIIG Bulletin,* 1 (2), 1971, p. 7–12.

6 HALL, J. J. Facsimile information network development. *Aslib Proceedings,* **22** (5), 1970 p. 217–25.

7 DEBARRA, S. *Needs of users of the Building Information Service.* UMIST Report 1966 for Diploma in Technical Science.

8 PAWLEY, E. Information, technical. *American Institute of Architects Journal,* **46** (2), 1966.

9 RIBA, *The architect and his office.* RIBA, 1962.

10 RIBA, *The construction indexing manual.* RIBA, 1968.

11 PROPERTY SERVICES AGENCY (DOE), *The construction industry thesaurus.* DoE, Directorate of Building Development, 1972.

12 *Building Research Establishment Advisory Service.* BRS, Watford.

13 *The Building Centre Trust.* Store Street, London W1.

14 REPORTER, Costly bills face flat tenants hit by damp. *Evening Standard,* 8.3.67.

15 REPORTER, £250,000 hall leaks. *Daily Telegraph,* 4.3.66.

16 HILDREW, P. Trial and Error in the Concrete. *The Guardian,* 8.8.73.

17 REPORTER, £10,000 settlement for Marples by architect. *Daily Telegraph,* 4.2.71.

18 REPORTER, Threat to sue over luxury flats. *Daily Mail,* 2.2.66.

19 WESTONE, J. Professional Indemnity Insurance for Architects. *Insurance Brokers Monthly,* March, 1971, p. 182 *and* p. 184.

20 DOE, *Current information on maintenance.* DoE Property Services Agency, Croydon.

21 DOE, *Condensation in dwellings.* 1 & 2, HMSO, 1973.

22 DOE, *The estate outside the dwelling.* DoE Design Bulletin 25, HMSO, 1972.

23 BRITISH STANDARDS INSTITUTION, *BS 4940—Recommendations for the Presentation of Technical Information about Products and Services in the Construction Industry.* BSI, April 1973.

24 DOE, *An information system for the construction industry.* Directorate General of Development, DoE, HMSO, 1971.

25 DOE, Whither data co-ordination? *CIIG Bulletin,* 3 (4), 1974.

26 SNOW, C. *Architects, information and information services.* MSc Thesis, University of Wales (UWIST), October 1973.

27 HANSON, C. W. Research on users' needs: where is it getting us? *Aslib Proc.,* **16** (2), 1964, p. 64–75.

28 LINE, M. B. On the design of information systems for human beings. *Aslib Proc.* **22** (7), 1970, p. 320–33.

29 ASTRAGAL, Dial a Boffin. *Architects' Journal,* 13.2.74, p. 302.

30 SNOW, C. Letters. *Architects' Journal,* 13.3.74, p. 533.

31 MAY, D. H. *in: Computerised information for the construction industry.* CIRIA (CILG), 1969.

32 ASHWORTH, W. *Handbook of special librarianship and information work.* 3rd Edition. Aslib, 1967.

33 ELMAN, S. Special libraries—the users' point of view. *Special Libraries,* **62** (9), 1971, p. 340.

34 SNOW, C. *and* O'SULLIVAN, P. Setting up and operating information centres: the experiences of a research project. *Paper presented at CIB commission W52, June 1973,* BRE.UWIST, 1973.

35 MCBINNEY, W. B. *Relationship between response to SDI and salary level.* Bureau of Reclamation, Denver, Co., USA, January, 1969.

36 PAISLEY, *and* W. J. PARKER, E. B. Information retrieval as a receiver-controlled communication system. September, 1965, Symposium on *Education for Information Retrieval,* American Documentation Institute.

37 SLATER, M. OSBORNE, A. *and* PRESANIS, A. *Data and the chemist.* Aslib, 1972.

38 MYERS, J. M. *Industrial communications—theory and practice: proceedings of the Third Conference of the Institute of Information Scientists, Sheffield, 1969.* The Institute, 1969.

39 HILLIER W. *and* LEAMAN, A. A new approach to architectural research. *RIBA Journal,* 79 (12), 1972, p. 517–21.

40 BECKETT, B. Architectural Research in the UK *in*: seminar *Application of architectural research to practice.* The Commonwealth Foundation, 1973.

BRIEF REVIEWS

FID Study Committee, Information for Industry. Index to users studies. Netherlands, Federation Internationale de Documentation, 1974. 103 pp. $12. (ISBN 92 66 00515 0).

The index provides access to and lists references for more than 200 recent significant studies from over twenty countries. The studies included are those analysing what people do in seeking information and how information services are used. Excluded are studies solely analysing information services unless there is a reasonable review of user interaction with the service. Most of the references are within the past ten years and only a few earlier highly useful studies have been included. The index is selective but is intended to be useful, with important, representative references. Each of the studies is indexed and listed under all important subjects covered. Where known, indexing terms include the author, discipline, study methodology and application. The subject index includes the authors and the reference. The reference section includes an abstract if available. There is a separate author index.

MAGUIRE, C. *and* KENCH, R. Information and the small manufacturer. Australia, School of Librarianship, University of New South Wales, 1974. 96 pp. $7.50. (ISBN 0 909644 05 5)

A report on the information needs of small manufacturers in New South Wales, Australia. A questionnaire was sent to 3,511 small manufacturing businesses employing between 1 and 100 persons. The results show that the small manufacturer is not aware of his need for information except in a crisis situation when practical information is needed quickly. Present sources of information are suppliers, people in similar businesses, trade or employers' associations and trade magazines. Small manufacturers preferred the idea of an information and referral centre, accessed by telephone, as a source of information. Although small changes may be made to improve the information flow, a radical change such as setting up an information centre, as a pilot project, responsible for co-ordinating and supplementing existing information services and capable of analysing research data and presenting it in a form usable by the manufacturers, is necessary.

Aslib Proceedings, 27 (3), March 1975, p. 124. Printed in Great Britain

The Directory of Published Proceedings

Series SEMT, Science/Engineering/Medicine/Technology
Monthly edition and Annual Cumulative Volume

Series SSH, Social Sciences/Humanities
Quarterly edition and Four Year Cumulative Volume

Series PCE, Pollution Control/Ecology, semi-annual

Conference Proceedings Acquisitions Program

Your inquiries are invited.

INTERDOK CORPORATION
173 Halstead Avenue, Harrison, N.Y. 10528

Choose your carpets with confidence

from DODSON BULL

UP TO 30% DISCOUNT

ALL LEADING BRANDS

Wilton ● Axminster ● Oriental ● Tufted

- All makes available with full Manufacturers' Guarantees
- Free delivery in U.K.
- Expert fitting service available

£200,000 carpets on display
in our extensive London and provincial showrooms

Free brochure on request to Dept. ALB

DODSON-BULL CARPET CO. LTD.

LONDON: 5 & 6, Old Bailey, EC4M 7JD. Tel: 01-248 7971
BIRMINGHAM: 164, Edmund St., B3 2HB. Tel: (021) 236 5862
BOURNEMOUTH: 268, Old Christchurch Rd., BH1 1PH. Tel: 21248
BRIGHTON: 2-5, North Road, BN1 1YA. Tel: 66402
BRISTOL 2-3 Royal London Hse, Queen Charlotte St: BS1 4EX.Tel: 28857
EXETER: 157, Fore St., EX4 3AT. Tel: 32019
GLASGOW: 166, Howard St., G1 4HA. Tel: (041) 221 3278
LEEDS: 12, Great George St., LS1 3DW. Tel: 41451
MANCHESTER: 55-61, Lever St., M1 1DE. Tel: (061) 236 3687/8/9
NEWCASTLE-upon-TYNE: 90-92, Pilgrim St., NE1 6SG. Tel: 20321/21428
WESTCLIFF-on-SEA: 495, London Rd., SS0 9LG. Tel: Southend 46569
Open: 9.00-5.30 Mon.-Fri., Sat. 9.00-12.00 (Manchester 9.00-4.00)

Aslib Occasional Publication No. 15

Short course assessment and evaluation in the library/information field

Margaret Slater

£5.00; £4.00 Aslib members
SBN 85142 063 X

3 Belgrave Square SW1X 8PL

Aslib Publications

14 NOV 1975

British Technology Index

CURRENT SUBJECT GUIDE TO BRITISH TECHNICAL JOURNALS

FOR TRACING AND RECALL

of $\left\{\begin{array}{l}\text{specific}\\\text{recent}\end{array}\right\}$ information

in the Field of Applied Science, Engineering and Manufacturing Technology

Monthly Parts and Annual Volume

THE LIBRARY ASSOCIATION

7 Ridgmount St. Store St. London, WC1 7AE

(Phone: 01-636 7543)

Introducing the first multidisciplinary guide to review articles

INDEX TO SCIENTIFIC REVIEWS™

Now you can easily retrieve review articles on any subject in science. The *Index to Scientific Reviews (ISR™)* will index them each year—over 16,000 reviews selected from more than 2,700 of the most important journals published throughout the world.

Broad Coverage
Over 100 disciplines in every area of science are covered:

Agricultural, Biological and Environmental Sciences
Engineering and Technology
Medical and Life Sciences
Physical and Chemical Sciences
Social and Behavioral Sciences

So you won't have to go through separate references to locate review articles for subjects in any of these areas. With one index—the *ISR* —you can cross disciplinary boundaries and retrieve these key articles no matter where they were published in the literature. The *ISR* will even cover the literature published in quarterly and annual "review" publications (e.g., *Annual Review of Biochemistry).*

Effectively Indexed
The *Index to Scientific Reviews* is organized to give you easy yet precise access to the review articles you need. You can search by authors, title words, word phrases, and organizations. In addition the *ISR* includes a citation index that permits you to start a search with previously published material relevant to a subject and retrieve more recent articles through citation relationships.

Highly Current
The *ISR* indexes the review literature on a calendar year basis. A soft-bound semi-annual issue (covering January to June) will be available each September, and a hard-bound annual cumulation will appear the following April. So you can find new articles while they're still new.

And Inexpensive
A year's subscription to the *ISR* costs only $250. You get a lot of information—and easy access to it—for your money.

What's In It For You?
The *ISR* could be the most welcome addition to your library you'll make all year. There just isn't any other reference tool that indexes so many review articles so effectively. Once you have it, you'll use it over and over again to find those one or two key articles you need to start you off on a really thorough search. And what better way to find those summary-type articles for students, researchers, and educators in need of quick reviews of subjects unfamiliar to them?

For More Information About The ISR . . .
The first *ISR* annual cumulation (covering the 1974 literature) will be out soon, so get the full story on the *Index to Scientific Reviews* now. Just fill in the coupon, and mail it today.

I'd like to know more about the *Index to Scientific Reviews™*. Please send me full information including details on discounts for multi-year subscriptions.

☐ Also send a complete list of source publications indexed by the *ISR™*

Name ____________________ Title ____________

Organization ____________________

Address ____________________

City ____________________ State/Province ____________

Zip ____________________ Country ____________

ISI® Institute for Scientific Information
325 Chestnut St., Philadelphia, Pa., U.S.A. 19106 Tel. (215) 923-3300, Cable: SCINFO, TEL
European Headquarters:
132 High Street, Uxbridge, Middlesex, U.K. Phone: Uxbridge 30085, Telex: 933693

©1974 ISI

Published in England by Aslib, 3 Belgrave Square, London SW1X 8P
Printed at the Alden Press, Oxford

1 NOV 1975

Aslib Proceeding

R & D INFORMATION SERVICES IN THE ENERGY INDUSTRIES

The role of the Department of Energy *A. J. van Riemsdyk*

National Coal Board *S. Conchie and B. Ramsbotham*

Central Electricity Generating Board *P. R. Mullins*

British Gas *R. E. Wiggins*

BP Research Centre *D. G. Lee and P. F. Cole*

No slick answers?—Library resources to serve the offshore oil industry *R. J. Ardern*

CALCUTTA UNIVERSITY

APRIL 1975
VOL. 27, NO. 4

1975-76 EDITION JUST PUBLISHED!

ENCYCLOPEDIA OF ASSOCIATIONS

THE NINTH EDITION—**completely revised, updated, and reset in a more legible type face—will be even more useful than previous editions . . .**

Librarians consult the **Encyclopedia of Associations** first for sources of current, authoritative information, which associations are uniquely equipped to provide on thousands of subjects. Just published, the Ninth Edition includes some 20,000 changes plus 1,255 brand-new listings. Covered along with national nonprofit membership organizations are selected non-membership groups, foreign groups of interest in America, U.S. local and regional groups of national interest, and citizen action groups and governmental advisory bodies concerned with specific problems.

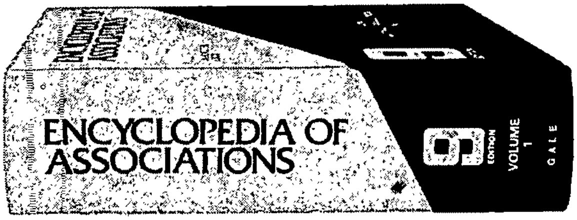
Volume 1, **National Organizations of the United States.** Over 12,600 of the 14,563 entries in the basic Volume 1 are full descriptions of active associations. (Others are listings for inactive or defunct groups, pseudo-organizations, etc.) Active organizations are arranged in 17 subject categories: trade, agriculture, scientific, educational, public affairs, etc.

Information given in each entry includes the group's name, address, chief executive, phone number, purpose and activities, membership, publications, convention schedule, and other details.

The 40,000-item alphabetical and keyword index—which now refers to entries by number—lists associations both by proper names and under the keywords that best identify their fields of activity.

Volume 2, **Geographic and Executive Index.** The Geographic Section lists in state and city order all the associations that are arranged in Volume 1 by subject. Included are addresses, phone numbers, and names of executives. The Executive Section lists by surname all the executives mentioned in Volume 1, followed by their titles, names of their organizations, complete addresses, and phone numbers. Each listing in both sections gives the number of the detailed organization entry in Volume 1.

Volume 3, **New Associations and Projects.** This quarterly supplement to Volume 1 is published during the period between the 9th and 10th editions in order to provide subscribers with details on the hundreds of new organizations constantly being formed to deal with new problems and concepts, or to try a new approach to old situations.



Reviewers have had high praise for previous editions of EA:

"Since its introduction in 1956, the *Encyclopedia of Associations* has earned its reputation as a cornerstone of any sound general reference collection . . . In a word, the *Encyclopedia of Associations* is a basic reference tool. All libraries should have it." **(RQ)**

"The only comprehensive source of detailed information on nonprofit American membership organizations of national scope." **(Guide to Reference Books for School Media Centers)**

"The largest directory of American associations currently available for library purchase . . . It is accurate and reasonably current. Recommended." **(The Booklist)**

The Encyclopedia of Associations Is Available on 30-Day Approval

**Volume 1, National Organizations of the United States.
ISBN 0-8103-0126-1. $55.00.**

**Volume 2, Geographic and Executive Index.
ISBN 0-8103-0131-8. $38.00.**

**Volume 3, New Associations and Projects.
ISBN 0-8103-0130-X. Inter-edition sub., $48.00.**

Place standing orders for the Encyclopedia of Associations and other Gale books of a continuing nature. Complete catalog of all Gale reference books sent on request.

GALE RESEARCH CO.
BOOK TOWER • DETROIT, MICH. 48226

Aslib Proceedings

VOLUME 27 **APRIL 1975** **NUMBER 4**

© 1975 Aslib and contributors

Aslib Proceedings *is published monthly and supplied free to members of Aslib. Subscription rates are £18.00 annually to non-members, or £9.00 to Aslib members requiring additional copies. Single copies £1.70, or 85p to members.*

Further information about Aslib's services and membership rates will be supplied on application to the Director, Aslib, 3 Belgrave Square, London SW1X 8PL. Tel: 01-235 5050. Telex 23667; answer-back, Aslib London.

Notes for contributors

Aslib Proceedings now accepts contributed papers in addition to those presented at Aslib meetings and conferences. They should be of a practical nature and of some relevance to problems encountered in the everyday operation of library and information units, or services. Other kinds of contribution which will be considered for inclusion are short notes on new information units or special libraries; the introduction of new techniques or systems in existing libraries where these may be of general interest; equipment designed by members for special purposes and put into operation in their own organizations; and objective reports on experience with new 'packaged' commercially available information services.

Contributions, which should be typewritten, double spaced, single-sided on A4 paper, and not more than 3,000 words in length, should be addressed to the Editor, *Aslib Proceedings*, 3 Belgrave Square, London SW1X 8PL. If possible, authors should include a summary of up to 200 words with the typescript. Authors will receive twenty-five offprints of their article free of change.

CALCUTTA UNIVERSITY
CENTRAL LIBRARY

R and D information services: the role of the Department of Energy

A. J. van Riemsdyk
Department of Energy

*Paper presented at the Aslib Engineering Group conference on R & D Information Services in the Energy Industries, Geological Society of London, 25th–26th November 1974**

IN THIS PAPER I intend to try to explain briefly and in general terms the reasons for there being a Department of Energy. I will follow that by showing why the Department needs to have information about energy R & D and finally how the Department collects and holds information on energy R & D.

From my experience over the years in dealing with members of the public, I have learned that quite a large number of people do not really understand what the functions of a Ministry (or Department of State) are, what are its powers and what its limitations. In the minds of many people a Ministry is an opaque authority that knows all the answers and has all the powers—it is for this reason that the public sometimes thinks it should take all the blame as well. Quite a few of the many questions and suggestions that flow into the Department are based on this fallacy: for instance, 'What will the price of fuels be in the Argentine in ten years time?' 'How can I insulate my roof?' 'By paying royalties to so and so for his perpetual motion machine and cutting red tape the Department could cure the energy crisis and earn millions of foreign currency!' 'Why doesn't the Department dam the Channel and build a row of hydro-electric stations along it?'

Those who work in a Ministry know that the duties of the Ministry have been built up little by little historically; that it is not an opaque authority but rather a network of interrelated responsibilities, each based on some specific statute. The Nation, through its representatives in Parliament, have felt the need for legislation to be enacted to exercise some control or make some change or provide money for some activity thought to be in the national interest. An Act is passed, a Minister is made responsible for its implementation and the civil servants must be appointed to carry out the provisions and regulations made under the Act, and to advise the Minister on the functioning of the Act. As most Ministries have many Acts to administer, a large body of expert information and opinion comes to reside within each Ministry, but this information is always related to the particular statutes, and the Ministry is not obliged to be a source of information on matters outside those which Parliament has allocated to its responsibility.

---

* It was not possible to publish two of the conference papers in *Aslib Proceedings*, 'Present and future trends in the use of conventional forms of energy' by Dr I. Fells, and 'Novel forms of energy' by A. McClintock. Copies of these papers are available from the Aslib Engineering Group's Publications Secretary, Mr D. E. Clarke, 8 St Benedict's Close, Cranwell, nr. Sleaford, Lincs.

Aslib Proceedings, 27 (4), April 1975, p. 126–131. Printed in Great Britain

I will now try to illustrate these general remarks with reference to the Department of Energy and its predecessors. Inspection of Mines may be considered to have been the longest standing executive function of the Secretary of State for Energy and his predecessors. In 1842, following the First Report of the Children's Employment Commission (Mines), with which the name of Lord Shaftesbury is associated, an Act was passed limiting the employment in mines of women and young persons. Under this Act and a further Act of 1850, the earliest mines inspectors were appointed, originally under the Home Office and later under the Board of Trade. In 1942 the functions exercised by the Mines Department of the Board of Trade together with other functions exercised by the Board of Trade in relation to petroleum, electricity and gas were transferred to the Minister of Fuel and Power by an Order in Council appointing this Minister and establishing the Ministry of Fuel and Power as it was then called. This Ministry was created because of the importance of fuel during the war and its was concerned with fuel allocation to industry, domestic coal rationing, efficiency in the use of fuel, etc., in addition to mines inspection and other duties not created by the war situation. After the war the Ministry of Fuel and Power Act of 1945 confirmed the establishment of the new Ministry. In the following few years the Coal Industry Nationalization Act 1946, the Electricity Act 1947 and the Gas Act 1948 nationalizing these industries, imposed important new statutory functions on the Minister; he now carried responsibilities relating to policy coordination, organization, technology and research of these large fuel and power industries, while under the provisions of the Ministry of Fuel and Power Act 1945, which I shall quote from later, the Minister carried certain general responsibilities for all fuels, which naturally included petroleum; later the Pipelines Act 1962 and the Continental Shelf Act 1964 gave further, more specific responsibilities to the Minister in relation to petroleum. Under the Iron and Steel Act 1967, the iron and steel industry was nationalized and the Minister at that time carried responsibilities for this industry too, including, as in the case of the coal, gas and electricity industries, approval of the general lines of the R & D programme. To revert to energy—in 1957 the Minister's title was changed to Minister of Power and in the following years the nuclear power programme took shape and development of the gas and oil resources of the Continental Shelf began. In more recent years, as part of the trend towards creating 'super-departments', the Ministry was merged, first with the former Ministry of Technology and then with the Department of Trade and Industry. It has now re-emerged as a major department in its own right, headed by a Secretary of State with cabinet rank and with the important change from the former Ministry of Power in that it has taken over responsibility for the UKAEA and relinquished steel. However, the mines and nuclear inspectorates, for so long an essential part of the Department, will soon be leaving the Department of Energy and forming part of the new Safety and Health Commission, so a very old link with the past will be broken.

The Department of Energy is responsible for the administration of about 40 main Acts of Parliament; these include the Mines and Quarries Act 1954, Nuclear Installations (Licensing and Insurance) Act 1959, the Pipelines Act 1962, Thermal Insulation (Industrial Buildings) Act 1957, Continental Shelf

Act 1964, and those with which I am going to be concerned, namely, the Ministry of Fuel and Power Act of 1945, the Coal Industry Nationalization Act of 1946, the Electricity Act of 1947 and the Gas Act of 1948. It is these last-mentioned four Acts that lead me to the reason that the Department must be informed on energy R & D covering the quite wide field of energy production, conversion, distribution and utilization. I should stress, however, at this point that under these and other Acts the Department has to be concerned with mines safety and nuclear safety and with more specialized subjects such as gas standards, meter testing and pipelines. I will not concern myself here with information on R & D that has to be available to these branches of the Department; it is very specialized, *e.g.* the work of SMRE, and I am not competent to talk about it.

The functions of the Secretary of State for Energy are set out in the Ministry of Fuel and Power Act 1945, and these still hold good. The relevant words for the purposes of this paper in this Act are as follows:

> It shall be lawful for His Majesty to appoint a Minister of Fuel and Power who shall be charged with the general duty of securing the effective and co-ordinated development of coal, petroleum and other minerals and sources of fuel and power in Great Britain, of maintaining and improving the safety, health and welfare of persons employed in and about mines and quarries therein, and of promoting economy and efficiency in the supply, distribution, use and consumption of fuel and power, whether produced in Great Britain or not.

This quite widely cast directive imposes on the Secretary of State the duty to undertake or sponsor research, or satisfy himself that research is being undertaken that will further the aims set out above; in the later 1940s when fuel was in short supply, a number of research projects were financed in whole or in part by the department—these covered fuel cell research, gas turbine research (coal and peat fired gas turbines), windmill research, research into underground gasification of coal, also coal gasification and liquefaction research.

Later the fuel supply position became much easier, the nationalized fuel and power industries built their own research laboratories and initiated R & D programmes, so the work by the department was gradually terminated. The fuel situation now having become tighter, the department is again looking at some of the less orthodox sources of energy, that fall outside the domain of the conventional fuel and power industries. The Energy Technology Support Unit has been set up at Harwell for the purpose of studying some of these forms of energy.

The other three Acts to which I referred, those nationalizing the coal, gas and electricity industries, each contain clauses that oblige these industries to consult with the Secretary of State when settling their R & D programmes. The Secretary of State has, therefore, the additional function of approving the general lines of the R & D programmes of these three nationalized industries.

The Secretary of State, therefore, carries under statute both specific responsibilities for R & D under the three nationalization Acts for coal, gas and electricity, for agreeing with the organizations concerned the general lines of the research programmes of the National Coal Board, British Gas Corporation and the Electricity Council, and also the general responsibility under the Ministry of

Fuel and Power Act for securing the effective and coordinated development of coal, petroleum and other minerals and sources of fuel and power in Great Britain.

What machinery does the Secretary of State employ to assist him to carry out these functions? There are two bodies that serve this purpose. In the first place there is the Secretary of State's Advisory Council on Research and Development for Fuel and Power; this is an independent body composed of the Chief Scientist of the Department, representatives of the nationalized fuel and power industries, and members from private industry, other government departments and the universities. The terms of references of this Council are to advise the Secretary of State in relation to his statutory duties explained above. The Council is served by the staff of the Energy Technology Division of the Department, who are responsible for drawing the attention of the Chairman of the Council to major issues and for providing any relevant information. In the second place there is the staff of the Energy Technology Division. This Division seeks to assist the Secretary of State to fulfil his responsibilities by providing a body of scientific and technical information on all fuel and power matters, including, as a most important component, information on R & D. Hence the Division advises the Secretary of State on his specific responsibilities for R & D in two ways: that is, it advises directly and through the Advisory Council of Research and Development for Fuel and Power. The Division also provides technical assistance to other Divisions of the Department, provides representatives to sit on international committees, on interdepartmental committees, deals with scientific aspects of PQs and deals with scientific aspects of the Departmental correspondence, all of which requires accurate information on R & D.

These then are the reasons that the Department requires information on energy R & D. The next question is: how is this information collected? The information is collected by the scientific staff of the Energy Technology Division, each member of which is a specialist in one or other of the energy industries. The scientist keeps himself informed of current R & D and of R & D needs in a number of ways: by contacts and discussion, formal and informal, with other scientists in the nationalized industries, in private industry, in the Research Associations, at universities, and in foreign organizations, by visits to research establishments, by attending specialist international committee meetings (*e.g.* European Economic Community Committees, OECD committees, UN committees), by attending international conferences (*e.g.* World Energy Conferences, World Petroleum Congresses, IGU Congresses, CIGRE conferences—there are numerous meetings covering aspects of the energy industries), by reports of research sent by researchers, visit reports, reports (often specially requested) from the Scientific Counsellors attached to British Embassies in certain foreign countries. By this means—that is, largely personal contacts with other scientists working in related domains of technology—inside information is exchanged about projects, about likely avenues of research, about difficulties with projects, financial problems of projects, failures of projects; information is obtained about the research and its background, that would be unlikely to appear in the published literature, or at least not until a much later date.

This is not intended to be in any way a criticism of the technical press, and we do, in fact, place great reliance on the ability of the technical press and the technical journalists to winkle out information on what is afoot in the world of R & D. The technical press together with published report literature and conference papers I should regard as the second line of information. The technical press—by which I include the journals of the learned societies—has the merit that it contains properly written up accounts of work with facts and figures for which the author is prepared to be answerable and which he is ready to make public and to substantiate. We find the technical press, including the foreign technical press, a valuable source of information on industrial R & D and R & D projects abroad. Technical journalists and reporters in all countries are actively seeking out scientific and technical information and it is very much to our advantage to draw on their labours. Finally, as our third line of information we have review articles, bibliographies, abstract journals; these are useful to use in conjunction with one's own information retrieval system to check historically on new lines of research, to see if similar work has been proposed in the past and any projects undertaken, and also to catch anything that may have been missed. How is the information held so as to be available at short notice when required? It is held in various ways, depending on the kind of information with which we are dealing; most scientists who are experts in particular fields will keep their own records of information they have collected, which they know will not be readily available in the published literature; in addition to this there are properly indexed departmental files containing correspondence, committee papers, visit reports, requests for advice, etc., which can be drawn on at short notice. The Division also has a section that is concerned with reading through the technical press, both English language and foreign, and the report literature, to extract material of scientific and technical importance to the Department, including information on energy R & D worldwide; this involves reading through several hundred journals, etc., each month and bringing information to the attention of the scientific staff, indexing data and retrieving information on request; it is also often necessary to seek information from specialist libraries, such as those of the Research Associations, from industry, from our embassies abroad, if the request for information is outside the scope of the section. These are the ways in which the body of knowledge present within the Department can be made available to the Secretary of State and his staff. Although the mechanical part of the system operates satisfactorily, with access to computerized material developing increasingly, the system will always depend for its efficiency to a large extent on human memory and experience, and entirely on human judgment.

It may be worth while to conclude with a note on what kind of energy R & D attracts the interest of the Department from the qualitative point of view. This is indicated by the wide embrace of the wording of the Ministry of Fuel and Power Act, which I have already quoted more than once—in so many words, R & D that will promote the effective development of coal, petroleum and other minerals and sources of fuel and power, and the economy and efficiency in the supply, distribution, use and consumption of fuel and power. The R & D must, however, be such as to give promise of a fairly significant increase in technical efficiency or economic advantage. R & D that is aimed at improving details of technical processes or equipment, whose impact on the Nation's energy economy would be negligible, very important though it is in the general advance of technology, would not be the concern of the Department; it would not be at the level at which ministerial intervention could be considered effectual or at which it could influence fuel policies; moreover, keeping track of all R & D would require a very large staff and might open the Department to the charge of being involved in too great detail with the affairs of industry. It is none the less vital, when scanning news of energy R & D, abroad for instance, or when observing areas where successful R & D could overcome a stumbling block to the viability of a process, to exercise some vision in imagining the impact and repercussions that a quite modest but successful R & D project might have, and give it importance in consequence.

Aslib Membership List 1974/75

Members are listed alphabetically under the heading for the country in which they are located, the United Kingdom sequence appearing first. In the classified index, under each heading, the UK members appear first, in alphabetical order, followed by the overseas members, also in alphabetical order.

The entries in the list are based on the most recent information made available to Aslib by members and, in general, include notifications of changes up to August 1974.

Price £1.75 to members of Aslib
£4.50 to non-members

Aslib Publications

National Coal Board R & D information services

S. Conchie and B. Ramsbotham

National Coal Board, Hobart House

Paper presented at the Aslib Engineering Group conference on R & D Information Services in the Energy Industries, Geological Society of London, 25th–26th November 1974

THE NEED FOR INFORMATION and intelligence services has long been recognized. About 2,500 years ago an excellent service was supplied at Delphi. The Classical Dictionary attributes the success of this unit to 'the efficient accumulation and use of information', although Charles Seltman has recognized in the current awareness bulletins that have survived that the oracle experienced an all-too-familiar difficulty in distinguishing between 'the trivially inexplicable and the cosmically ineffable'.

Nowadays, although probably with a smaller staff, we can rarely get away with the ambiguities for which Delphi was famous. Even straight answers to straight questions form a relatively small, if often an exasperatingly difficult, part of our job. As with all large industries, the National Coal Board needs several forms of technical information and intelligence—the latter distinguished rather arbitrarily from information because it contains a larger element of evaluation and selection. There are many ways of grouping and integrating the several types of service, and it will be of interest to compare those of the large energy industries, which might be expected to have some organizational problems in common.

We would like to say something first about how the Board keep up to date with information on coal research in other countries; secondly, about our part in the broader field of energy research generally; and thirdly about how we arrange for the information derived from these outside sources to be passed on to those who will use it, that is the scientific and technical staff within the industry.

International exchange of information

The National Coal Board—and without doubt the other fuel industries—have made provision for keeping informed on research progress abroad in their own field by means of formal and informal agreements of this kind with the USA and Canada, an informal one with Germany, some rather fitful ones with Eastern European countries, and of course the whole muster of committees within the Common Market. It is part of the job of the technical intelligence services in the Board to keep informed of progress with these agreements and to do what they can to see that they prosper. For the American agreement signed

Aslib Proceedings, 27 (4), April 1975, p. 132–139. Printed in Great Britain

earlier this year, for example, the Board's Technical Intelligence Branch has been chiefly responsible for arranging individual contacts between scientific staff in the two countries and for monitoring progress, as well as for the more routine job of obtaining and distributing reports and other information. Links with the coal industries of the Common Market countries had been close for many years before Britain joined the Community, but joint discussion of the respective research programmes is now possible, with a number of projects supported by ECSC grants. Here too NCB's technical intelligence services play their part: and recent visits by library staff to France and Germany will, we hope, lead to collaboration in this field also.

Exchange of information between the energy industries

Information flow between the energy industries both at home and abroad is also a matter of increasing importance, and fortunately increasingly easy now that old rivalries are disappearing in the face of the common anxiety. Here perhaps we do not do enough. There is a Research Liaison Committee of the gas, electricity and coal industries: at a higher level is the Minister's Advisory Council on Research and Development, to which all the nationalized fuel industries submit their research programmes and which therefore gives an opportunity to keep up to date on the main lines of research: and at a more humble level, we exchange abstract bulletins and telephone each other from time to time. We believe we should do more, and after this very timely conference we might discuss jointly how best we can pool our experience.

The consumer

When it comes to output, that is, seeing that the information that has been gathered in from all sources—international contacts, inter-industry exchanges, and all the normal sources such as conferences, journals and published reports—reaches the right people, each organization must no doubt have its own problems. One of ours can be seen from Table 1. It is difficult, if not impossible, to draw a clear dividing line between research staff, other scientists and engineers, and management concerned with technical matters, and all these groups of people require the backing of library, information and intelligence services. Within the NCB there are separate units engaged in mining R & D (with coal preparation included), utilization R & D, scientific services directly related to coalfield operations, medical research, operational research and fuel technology. There are also—and this is what makes for the skew distribution in the table—several thousand engineers, technicians and scientists in the coalfields concerned in the management of on-going operations. Of course, many of these are grouped at area headquarters, and many are purely operational, with scientific or engineering interests confined to a very narrow field adequately covered by one or two technical journals. Nevertheless, supplying a technical intelligence and library service in such a situation requires a different structure from that of a single research establishment, however large.

Another feature of the Board's scientific and technical activities that we believe may be unique to the coal industry is the wide spread of disciplines that must be catered for. We have geologists involved in prospecting and evaluating

Location	Scientific and Engineering Staff		Library and Intelligence Services
Hobart House Headquarters (Offices only)	Staff of Chief Geologist and Chief Medical Officer, Minestone Executive headquarters staff, principal technical marketing staff	(70)	Headquarters Library (A) and Chief Librarian Technical Intelligence Branch Head (see also below)
Harrow (Offices only)	Headquarters staff of Scientific Control, Operational Research Executive, Opencast Executive, National Smokeless Fuels, and associated chemical companies	(200)	Library (B) Technical Intelligence Branch (4 scientific staff)
Doncaster (Offices only)	Chief mining and coal preparation engineers and staff and members of Operational Research Executive	(100)	Library (C)
Stanhope Bretby, Nr. Burton-on-Trent (Mining Research & Development Establishment)	Research staff	(400)	Library (D) (Scientific & technical information officer)
Stoke Orchard, Nr. Cheltenham, Glos. (Coal Research Establishment)	Research staff	(300)	Library (E) (Scientific & technical information officer)
Edinburgh (Institute of Occupational Medicine)	Medical and environmental research staff	(80)	Library (F)
Coalfield centres and laboratories	Area mining, coal preparation and ventilation engineers, Scientific Control staff, geologists, Opencast and Minestone Executives technical staff	(7500)	Libraries (A, B, C, & D) Technical Intelligence Branch

TABLE 1: *National Coal Board*

coal deposits (and also North Sea oil and gas, in which the Board are involved through subsidiary companies); physicists concerned with properties of rock and coal; mining, electrical and civil engineers getting the coal out and carrying out a rapidly expanding research programme on coal winning; physicists and chemists specializing in mine gas, dust, ventilation, fires and other underground hazards; doctors dealing with the diseases and accidents peculiar to mining; coal preparation engineers (a breed apart); more civil engineers dealing with the recovery and use of minestone and the rehabilitation of pit heaps and opencast sites; analytical chemists on coal quality systems and control; fuel technologists dealing with problems arising in coal utilization; carbonization experts and chemists concerned with coal byproducts—chemicals, gas, tar, etc.; and scientists and engineers from all disciplines carrying out research on coal processing, utilization and conversion to new forms.

Technical intelligence services

To supply the relevant information as it appears in published material alone for such a range of activities means covering almost the entire body of scientific literature. In the following section, an account is given of how the Board's six main libraries serve these needs, and the information retrieval systems used to ensure that published information can be speedily and widely made available. So far as selective technical intelligence services are concerned, we tackle the problem in several ways. The Research Establishments themselves are fairly well placed. Each has its own technical information officer who in collaboration with the Establishment libraries provides services to the research staff. In addition, we have located in London a Technical Intelligence Branch (TIB) of five scientists. This branch collaborates with the information officers of the research establishments, but it also has the responsibility for serving firstly the scattered scientific staff in the coalfields, secondly the headquarters technical staff, and thirdly management.

For the staff in the coalfields, the starting point is the technical abstracts prepared by TIB, which are distributed widely throughout the industry to the people who have no direct access to technical literature. Five abstract bulletins are provided, and the nature and scope of these are given in Table 2. The most important for the more isolated staff is the first bulletin, which has a wide general coverage. For this series, emphasis is placed on currency. Few items are more than a month old. We do not print or sell these bulletins: they are written, typed and distributed by the branch itself, which makes it possible to publish them quickly. Then, through the abstracts, many requests come back to the libraries, we become aware of specific interests of individual members of staff, and these can be pursued by visits, correspondence and telephone, and by supplying copies of relevant papers on a continuing basis. In addition, of course, many requests for technical information are channelled from the areas and outstations to TIB through the Headquarters staff of the departments concerned.

The other function of the Technical Intelligence Branch is to serve HQ technical staff and management. This involves not only the supply of current literature to meet known interests, but such services as briefing for meetings, help with lectures and papers, acting as secretaries to technical committees, explaining aspects of the Board's research to visitors, dealing with correspondence from the public on a wide range of suggestions and inventions (some of which certainly qualify as 'cosmically ineffable') and so on. Many of these duties naturally fall to members of Headquarters staff of technical departments, perhaps with help from TIB. But there is much to be said for having a central group involved in, or at least on the fringes of, research policy. There is no doubt that it helps us to deal more sensibly with enquiries and to select more judiciously the kind of information that is currently important.

Title	Nature of contents	Number of issues annually	Average number of entries
Technical Coal Press	10–12 line abstracts	12	100
Information Bulletin (Coal Processing and Combustion)	Titles only	12	200
Coal & Mining Geology	10–12 line abstracts	4–6	100
Fluid Mechanics	10–12 line abstracts	6	45
Mineral Products	Titles or indicative abstracts	6	80

TABLE 2: *Technical Intelligence Branch abstract and information bulletins*

In addition to these miscellaneous responsibilities, and the abstract bulletins with their cumulative index, the Branch produces between twenty and thirty literature reviews or selective and annotated bibliographies each year: and there are the endless enquiries from inside and outside the industry, large and small, trivial and startling, which fall to the lot of both library and intelligence staff.

Library and general information services

We have nothing to offer by way of sophisticated or ultra-modern methods in the operation of our libraries. Also without doubt we can be criticized for duplication of effort, but in the context of the Coal Board's organization described earlier this is to a large extent inevitable. The geographical spread of the various establishments makes post and telephone the commonest forms of communication and centralization of all information services would result in undesirable delays. Also, since the Research Establishments, Areas and other units are to a large extent autonomous, with the Chief Librarian acting in an advisory capacity, there is some variation in methods and each library organizes its activities to suit the immediate needs of the staff in its own establishment. This does not mean there is no co-operation among the libraries. Each has its subject specialities, and there is a constant exchange of information.

It is difficult to isolate the services provided by the NCB libraries to research from those provided for the industry as a whole. Research workers are as likely to use us for quick reference information and for bibliographical searches in just the same way as non-research staff, so this paper will inevitably cover the Board's library and information service as a whole.

The transmission of information is a two-way business and we cannot provide a service unless we know what research is going on. Nothing is better than the simple process of talking to staff and generally keeping our eyes and ears open, but the Board's Research Programme submitted annually to Government can help in anticipating demands. One of our main problems is that of persuading the many departments, Executives, and associated bodies to give information on their internal reports. It will be interesting to learn whether others have this problem, which again is in some measure due to the wide scatter of the Board's interests and, geographically, of its activities. In consequence, there can be no standard form or central control of publication, which makes it difficult to check comprehensively.

All the libraries provide a current awareness service coupled with an SDI service, the emphasis being on speed. The Mining Research and Development Establishment does not circulate periodicals, but distributes a weekly current awareness bulletin. A register of the subject interests of individual staff is maintained and the current awareness bulletin is followed by a note to individual members of staff drawing their attention to specific articles likely to be of interest to them. The main difficulty in maintaining this SDI service is that because many projects are of short-term duration, interests are continually changing, and there is little feedback. The Coal Research Establishment circulates periodicals, but not a current awareness bulletin. All periodicals are scanned and notes of individual articles sent to members of staff.

The Headquarters Library circulates periodicals among headquarters staff and also distributes current awareness bulletins on a variety of specific subject fields such as Energy, Economic Situation, Mining, Industrial Relations. These contain information on new books, periodical articles, press cuttings, reports and pamphlets. They are distributed not only to individual members of staff in the main establishments, but also to areas and collieries. Staff at collieries are as important as any in the industry, and one of our greatest problems is to make contact with them and to maintain that contact. Photocopies of articles are sent on request.

Because of the importance attached to speedy service, these current awareness bulletins are informative rather than evaluative. A more critical selection, with evaluative annotations is provided by the Technical Intelligence Branch Abstract Bulletins described earlier.

We lack a really comprehensive service for *retrospective searching*. There are selective abstracting services such as Fuel Abstracts, SMRE Abstracts, the bibliographical services of Cerchar (the documentation service of the French Coal Industry), and also general indexing services such as Chemical Abstracts, Engineering Index, BTI. However there tends to be an excessive time-lag with some of these publications. The Board's Technical Intelligence Branch maintains a cumulative card index, going back over twenty years and more, of the contents of its selective abstract bulletins, but it was felt that for the mining literature at least a complete index with facility for ready retrieval of material on specific subjects was needed. For this reason a coordinate index was started about four years ago at the Headquarters library, which indexes all articles on mining, the field which we felt most needed doing. It covers 150 journals, approximately, and is now beginning to prove its worth. The coordinate index was chosen as it would provide for the indexing in depth that was required. The UDC schedules for coal-mining have two disadvantages: the latest edition of the full schedules is in German only, and the overall outline is not very logical. There is a recent extension in English. The scheme used by Cerchar is more logical but lacks detail. No thesaurus existed, and this has been developed as we went along. It now contains about 2,000 terms. In its initial stages it was very simple, using single terms throughout, with one or two exceptions. We are now in a position to revise it, combining terms where desirable, and plan to duplicate it for distribution to all our libraries.

The most interesting development in the near future is the project to *computerize* the library catalogues for which we have recently been granted approval. This will enable us to provide a Union Catalogue not only at the Board's main libraries but also at all administrative units throughout the country. This is in the planning stage as yet; we know what we want and we are in the position of being able to learn from the experience of others.

We hope to provide a classified file based on UDC together with an author index, for books, periodical articles, reports, etc., with an alternative means of search by key words. The output will be on microfilm. This should enable us to extend the scope of our indexing—at the moment we are indexing mining journals only—and also to be able to do this on a co-operative basis, with all the libraries sharing the work.

We are to some extent still in the steam age as far as library and information services are concerned in the coal industry. We hope to do something to remedy this with the computer project, which will enable us to extend the scope of our storage and retrieval of information in the future. Whether we will ever be able to back-track over the wealth of literature during the past fifty or so years is another matter.

Our fields of interest extend well beyond coal mining, and for library and general information services as well as in the purely technical intelligence field we hope that some measure of co-operation may emerge as a result of this conference. International co-operation too, judging by the discussions we have recently had with Cerchar and in Germany, is well within the realms of possibility.

Translations

A translation service is provided by a small staff of translators in the International Department. English titles are provided for all articles in foreign periodicals and are circulated with the periodical. Translations of articles, either in synopsis or in full, are provided on request.

Conclusion

From this outline, it may seem that our services in the Board are less tightly planned and coordinated than those of some other large industries. Some of the reasons for this have already been given. But there is always a large element both at the giving and at the receiving end of communication, and human element demands flexibility.

We are involved in an old industry, and a huge one, and one that is still growing—in fact which has just had a new lease of life. This is manifest particularly in its research and development activities and in the introduction of new technology, and the technical information and intelligence services must grow and change to match this new pattern.

The opinions expressed in this paper are those of the contributors and not necessarily those of the National Coal Board.

Now ready

ENGINEERING EPONYMS

An annotated bibliography of some named elements,
principles and machines in mechanical engineering
2nd revised edition
By C. P. AUGER

130 pages ISBN 0 85365 437 9 *£4 (3.20 to members)*

**BRITISH LIBRARY HISTORY:
BIBLIOGRAPHY 1969–1972**

Edited by DENIS F. KEELING
Compiled by the Library History Group
150 pages ISBN 0 85365 417 4 *£4.50 (£3.60 to members)*

THE LIBRARY ASSOCIATION

Central Electricity Generating Board R & D information services

P. R. Mullins

CEGB, Berkeley Nuclear Laboratories

Paper presented at the Aslib Engineering Group conference on R *&* *D Information Services in the Energy Industries, Geological Society of London, 25th–26th November 1974*

Introduction

IN A PAPER of this nature it is difficult to avoid presenting a catalogue in the 'what we do in our . . .' vein. Yet any claim to usefulness will probably lie in providing an outline of the service for comparison purposes and, incidentally, in showing possible areas of co-operation with other information units. For that reason, before describing the information activities of the Central Electricity Generating Board (CEGB), it may be appropriate to outline the structure of the British electricity supply industry, bringing out the position in it of the CEGB, and then to consider the organization of the Generating Board itself.

The electricity supply industry

Figure 1 shows the organization of the electricity supply industry in England and Wales. The coordinating body is the Electricity Council, which has a Chairman and two Vice-Chairmen, and representation from the CEGB and the Area Boards. The latter are concerned with the distribution and retailing of electricity, while the CEGB produces the supply of electricity in bulk for the Area Boards to distribute. Thus, generation and transmission are the responsibility of the CEGB, which incidentally has one of the largest fully interconnected electricity networks in the world.

Figure 2 shows the organization of the CEGB. The system comprises some 170 power stations, linked by the high voltage transmission networks (the Grid). Its operation is organized in five regional units each responsible for the management and efficient operation of the power stations and transmission systems in its particular geographical area.

The CEGB's Headquarters, situated near St Paul's in London, contains a number of departments: Operations, Planning, Engineering Services, Secretary and Solicitor's, Nuclear Health and Safety, Research, Finance and Personnel together with the Press and Publicity Office. Management Services Department is located mainly in the Computing Bureau at Park Street, in Southwark, adjacent to the National Control Centre. In addition there are two large divisions, Generation Development and Construction Division and Transmission Development and Construction Division (GDCD and TDCD), located at Barnwood

Aslib Proceedings, 27 (4), April 1975, p. 140–153. Printed in Great Britain

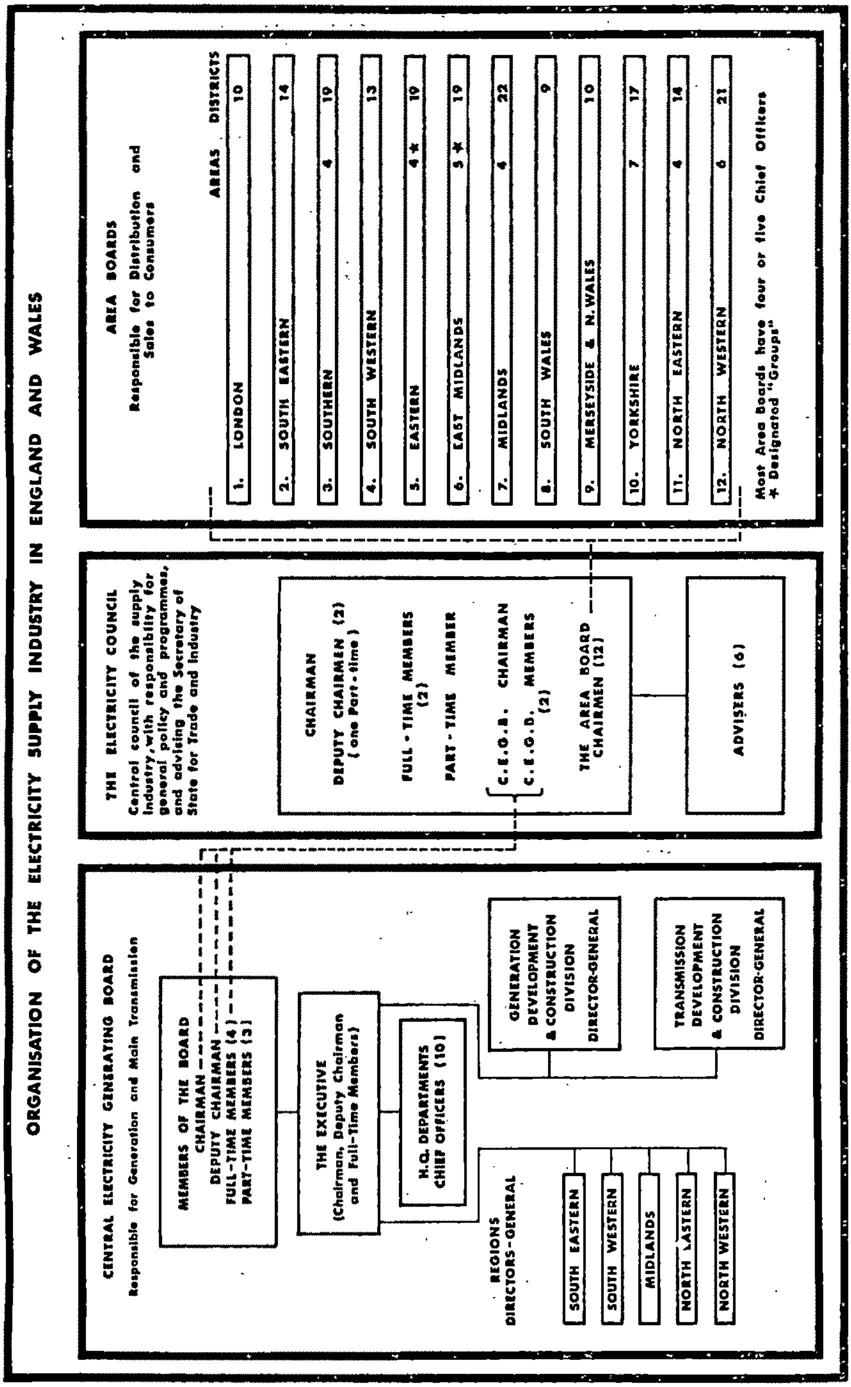
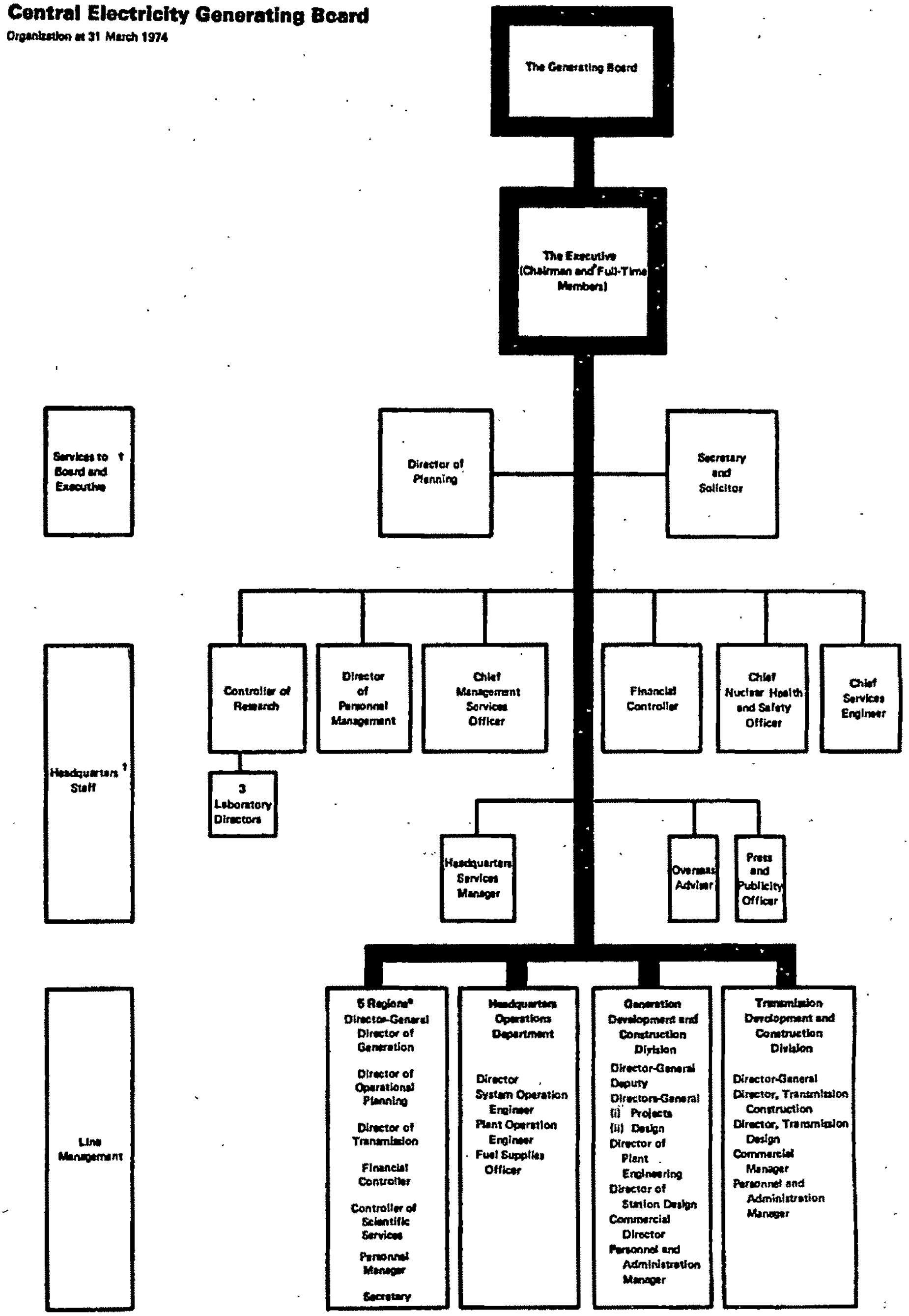


FIG. 1: *The electricity supply industry in England and Wales*


Central Electricity Generating Board
Organization at 31 March 1974
The Generating Board
The Executive (Chairman and Full-Time Members)
Services to Board and Executive †
Director of Planning
Secretary and Solicitor
Headquarters Staff †
Controller of Research
3 Laboratory Directors
Director of Personnel Management
Chief Management Services Officer
Financial Controller
Chief Nuclear Health and Safety Officer
Chief Services Engineer
Headquarters Services Manager
Overseas Adviser
Press and Publicity Officer
Line Management
5 Regions*
Director-General
Director of Generation
Director of Operational Planning
Director of Transmission
Financial Controller
Controller of Scientific Services
Personnel Manager
Secretary
Headquarters Operations Department
Director
System Operation Engineer
Plant Operation Engineer
Fuel Supplies Officer
Generation Development and Construction Division
Director-General
Deputy Directors-General
(i) Projects
(ii) Design
Director of Plant Engineering
Director of Station Design
Commercial Director
Personnel and Administration Manager
Transmission Development and Construction Division
Director-General
Director, Transmission Construction
Director, Transmission Design
Commercial Manager
Personnel and Administration Manager

†Headquarters' Staff Departments provide a service to the Board and the Executive, and, in addition, supply specialist services and guidance to the whole of the Board's organization.

*Typical organization at present.

FIG. 2: *The organization of the CEGB*

(Gloucester) and Guildford respectively. These are concerned with developing new generating stations and providing major extensions to existing ones (or in the case of TDCD, the transmission system).

Research in the CEGB

To keep up with the requirements of a steadily increasing demand for electricity, the industry has over the last 15 years or so developed from one based almost entirely on coal as its fuel to one which, although still largely dependent on coal, uses a mix of coal, oil and nuclear fuels with a small amount of hydro-electric generation. In consequence, the support of an active Research Department has been imperative.

Some idea of the growth in the expenditure on research in the CEGB is shown in Figure 3. Last year, of the £18M. spent, about half was devoted to work arising from operational problems. About 1,000 professional staff are engaged on research activities, with a further 1,300 people supporting them. The research function is administered from the London Headquarters but the actual research is carried out at the three HQ Laboratories, the Central Electricity Research Laboratories (CERL) at Leatherhead in Surrey, Berkeley Nuclear

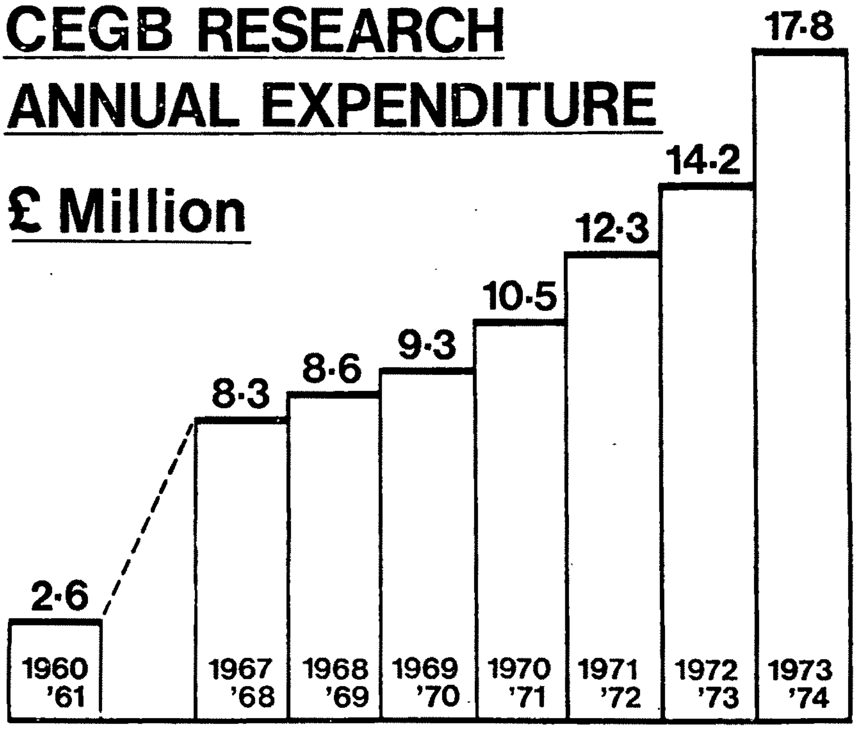


FIG. 3: *The growth in research expenditure in the CEGB*

Laboratories (BNL) in Gloucestershire and Marchwood Engineering Laboratories (MEL) near Southampton, together with the research and development activities of the Scientific Services Departments (SSDs) in each of the five regions. The SSD work is closely tied in with the operating aspects of their power stations. There is close co-operation between all the research centres and this is, of course, extended to their information activities.

CERL at Leatherhead, largest of the Board's research laboratories, had its origins in 1932. With 350 graduate research staff in its total of about 800, the research is carried out within six divisions across a wide range of subjects relating to the operation of power stations (both fossi fuelled and nuclear), transmission systems and environmental aspects.

Although there is now an appreciable nuclear content at all three HQ laboratories, the bulk of the Board's research on nuclear power is carried out at Berkeley Nuclear Laboratories, situated on the banks of the Severn in Gloucestershire. Research at Berkeley is required to support the presently operating Magnox reactor system, the Advanced Gas-cooled Reactors now being commissioned, and to assess the competing claims of future types of nuclear power stations. The underlying philosophy of the work is to enable the Board to be an informed user of nuclear power. The object is to gain an understanding of fundamentals underpinned with hard experimental information from the laboratory work, to apply it to attack operational difficulties and to assess, for example, the competing claims of different reactor types for future adoption in the United Kingdom. Of the 700 staff rather more than 250 are professional scientists employed in the four scientific divisions, materials science, reactor fuels, reactor physics and applied physics.

As the name implies, the Marchwood Engineering Laboratories, which were inaugurated in 1963, are concerned with heavier engineering research. Marchwood's activities complement those of the other two laboratories in that, because the behaviour of large items of plant is frequently too complex for its performance to be predicted adequately from small-scale laboratory experiments, full-scale tests are often required. For example, the performance testing of large oil or coal burners for power station boilers, or of large circuit breakers, may require full-scale work. Marchwood Engineering Laboratories are slightly smaller than the other two, employing some 400 scientific and support staff.

The information structure in the CEGB

Figure 4 shows the current structure in which the Headquarters information services are the central component in an information network made up of autonomous but cooperating units in the London Headquarters, the Headquarters Laboratories (CERL, BNL and MEL), the Regional Headquarters, the Regional Scientific Services Departments, the Construction Divisions and Management Services Department (Computing Bureau). This network services the whole spectrum of CEGB interests. Although the units in the three HQ laboratories and the five SSDs obviously operate in a research and development environment, no distinction is made between the services to R & D and those to other groups in the Generating Board.

Some idea of the relative sizes of the various library and information units which make up the information network is given in the staffing chart (Figure 5). The numbers shown are necessarily approximate because of the differing activities undertaken by the various units. For example only a limited number of information sections undertake the report publishing and processing function. In addition one service is being reorganized and hence the figures for it are tentative.

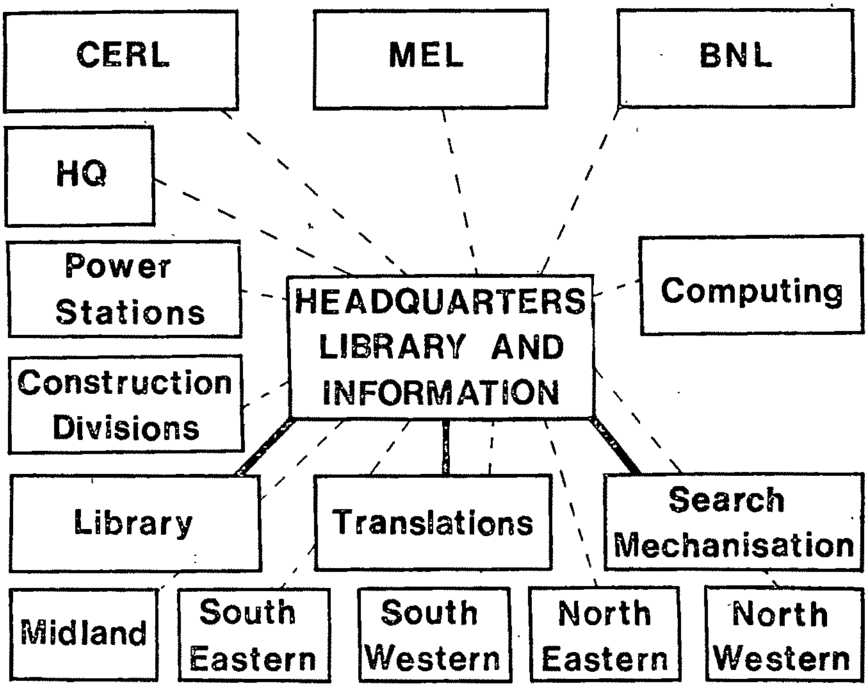
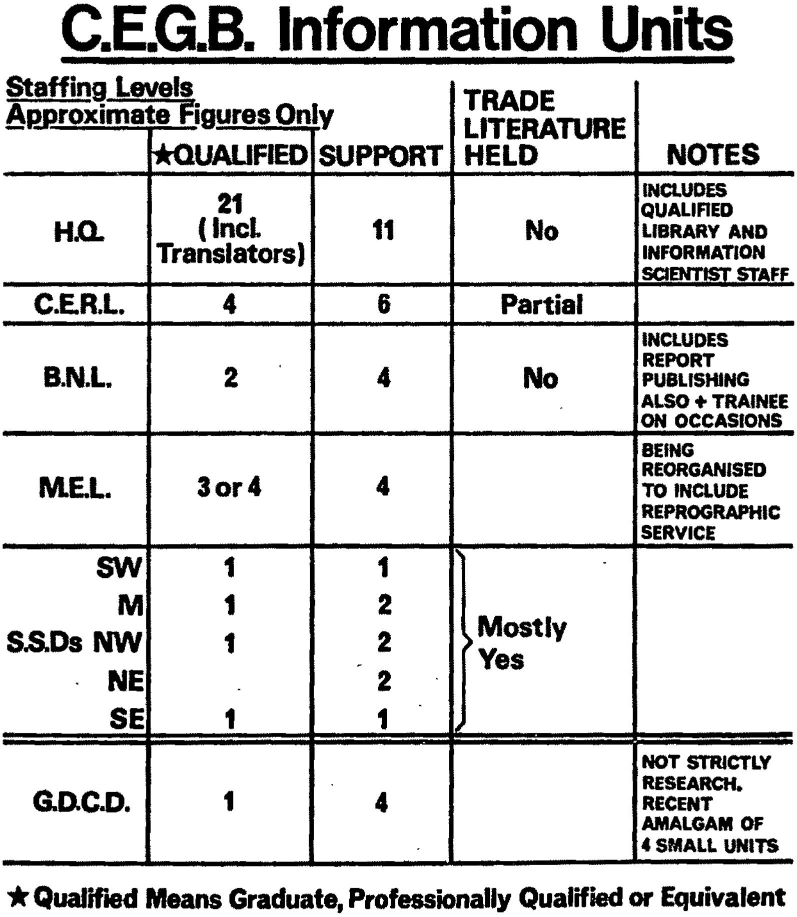


FIG. 4: *The CEGB's information structure*

HQ information services

As Figure 5 shows, the largest unit in the network is the HQ Information Service: it provides the bread-and-butter service of an industrial information department by the quite conventional means of an extensive library, a translations section and a search and mechanization section. The latter, as its name implies, is staffed by information scientists engaged in scanning, searching, liaison and mechanization activities, together with some technical committee, technical writing and editing work. The services of the HQ unit are not restricted to staff at the London HQ but are available, and used quite widely, throughout the Board. They supplement the library and information units developed locally to cater for the more specialized requirements of the Laboratories and Regional SSDs.

The present unified service in London was the result of a merger in 1963 of two earlier units, the Technical Information Service (TIS) which served the industry as a whole, and the Research Information Service (RIS), a unit introduced to support the increased level of specialized research resulting from the setting up of the CEGB in 1958. The expanded service, in addition to the traditional library and technical information functions, covered technical writing and the servicing of some committees, mostly of an R & D nature.



C.E.G.B. Information Units

Staffing Levels Approximate Figures Only			TRADE LITERATURE HELD	NOTES
	★QUALIFIED	SUPPORT		
H.Q.	21 (Incl. Translators)	11	No	INCLUDES QUALIFIED LIBRARY AND INFORMATION SCIENTIST STAFF
C.E.R.L.	4	6	Partial	
B.N.L.	2	4	No	INCLUDES REPORT PUBLISHING ALSO + TRAINEE ON OCCASIONS
M.E.L.	3 or 4	4		BEING REORGANISED TO INCLUDE REPROGRAPHIC SERVICE
S.S.Ds SW	1	1	Mostly Yes	
M	1	2		
NW	1	2		
NE		2		
SE	1	1		
G.D.C.D.	1	4		NOT STRICTLY RESEARCH. RECENT AMALGAM OF 4 SMALL UNITS

★ Qualified Means Graduate, Professionally Qualified or Equivalent

FIG. 5: *Staffing chart for R & D information units*

This particular activity, in which the information scientist acted as committee secretary, had the advantage of providing direct contact between the information officer and senior research staff at a policy-making level. The price to be paid, of course, was the time expended in servicing the committee.

Because of their differing needs, it has been found best to let the outstation information units develop more or less independently with the backing of HQ information services for items which it would be uneconomic to duplicate locally. The relatively informal co-operation which exists throughout the system is fostered by the liaison responsibilities of the HQ information scientists, who each have a link with a specific 'non-London HQ' location. The liaison activities include Assassin profiling, soliciting enquiries and generally publicizing the HQ service. An officer may spend as much as 25 per cent of his time working for, and visiting, his outstation unit. By this method an effort is made to give a personal service to users in power stations and at other widely scattered locations in a very large organization. Evidence of the co-operation within the network is provided by the system whereby the outstation units are involved in the actual preparation of material for the HQ service. For example, the SDI service and report activities receive some input direct from the laboratories information services.

Dissemination channels

(a) At Board Headquarters
Various media are used to disseminate information. Figure 6 shows the principal channels employed at CEGB Headquarters.

The most widely circulated publication is *Digest*, which is a current awareness and abstract bulletin on electricity supply topics. In addition, it frequently

HQ DISSEMINATION CHANNELS

CEGB DIGEST – M
'MATERIALS' Supplement – M
'COMPUTERS' Supplement – M
REPORTS LIST – M
SDI SERVICE Fortnightly
INDIVIDUAL NOTIFICATION

TRANSLATIONS – Bibliographies

FIG. 6: *CEGB Headquarters dissemination channels*

contains contributed articles on topics that are likely to be of wide interest to the industry. As well as having a wide circulation within the electricity supply industry, where it is of particular interest to power station and regional staff, it is available on subscription to outside organizations. In addition there are the two specialist supplements (*Materials* and *Computers and Control*). There were originally more but with the passage of time their subject coverage, where still relevant to current interests, has been included in the main *Digest*. Most of the information in the paper by Prior,[1] which described in more detail the information bulletins of the CEGB, is still correct. It may be worth noting that although the research orientated users in the laboratories find *Digest* valuable, they consider that they are more directly served by *Materials* and other supplements, and even more so by the SDI service which is tailored to their individual needs.

The *CEGB Reports List* covers the major report series issued in the Board on both research and more general topics. It is one of the bulletins which has some of its material contributed directly by other centres in the information network. Abstracts are not included in this list, which has continued for some time in its present form.

The selective dissemination service (SDI) has been based on a fortnightly service of specific information circulars carrying information in specific subject areas which were sent out to recipients according to their notified category requirements. It has recently been converted to a computer based and individually profiled scheme.

An individual notifications service is also provided by the information scientists at HQ from the daily scanning of incoming journals and other literature. This tends to be a supplementary service to cover the requirements which have been brought to light by past enquiries or by direct knowledge of scientists' and engineers' interests.

The aim of the translations service is to cover all reasonable requirements for translations arising within the CEGB. Most are into English, though work from English into another language is sometimes required. Many of the translations are actually carried out by the information services staff; others are put to outside translators, in which case our own staff act in an editorial capacity. Usually arising from a specific subject enquiry, or sometimes when an upsurge of interest in a topic is expected, bibliographies are prepared by the search and mechanization group. The extensive range of translations and bibliographies are published formally and are available outside the industry for a nominal charge.

(*b*) *In the research centres*

In the research centres such as BNL, CERL, etc., the dissemination media are a combination of the HQ services previously mentioned, such as *Digest* and Supplements, Library Accessions, the Reports List, the SDI service, etc., together with the locally produced items (Figure 7). These may include all or some of the following: local Reports Received Lists (which may include those received as microfiche), Library Accessions (book lists), periodical contents page bulletins, lists of papers by the research centres' authors and lists of classified and unclassified reports issued. For at least one location this is supplemented by a limited service of personal notifications based on a scanning of the 400 or so journal titles, mainly to senior officers. In addition, external computer based SDI services are employed with some success as alerting systems. At Berkeley Nuclear Laboratories, for example, they include UKCIS, NSA/Atomindex, the Department of Industry's service & ASCA, together with the European Nuclear Documentation Service (ENDS) for specific retrospective requirements. An example of the support for the employment of these services comes from one group of user scientists[2] who investigated the effectiveness of two (UKCIS and ASCA). They found that for their interdisciplinary field the two services were complementary, and it was concluded that both services were necessary to cover their needs. The extent to which the outside services are used varies widely from place to place but nearly all units employ them to some extent to cover specialist interests, in addition to the Board's own SDI service. The principle of HQ plus local coverage applies generally throughout the CEGB information network. The balance varies considerably depending on the state of development of the local service—from almost complete dependence in small outstation units to near autonomy in places such as CERL and BNL.

Research Centre Dissemination

HQ. Services	Local Services
Digest & Supplements	Reports Received Lists
Library Accessions	Book Lists
Report List	Periodical Contents Page
SDI. Service etc.	Bulletins
	List of Papers by Research Centre Authors
	Lists of Reports Issued
	Personal Notifications
	Outside Alerting Services

FIG. 7: *Research centre dissemination*

Development of the HQ computer based service

Until quite recently most of the bulletins were produced, and the service operated, manually. We are now beginning to see results from the compute based system. This uses the Assassin program, developed by ICI's Agricultural Division, which has been bought by CEGB information services for use in providing an SDI service, with retrospective searching facilities. It produces abstracts for the main files, a structured thesaurus and KWOC indexes which may be copied and sent to other units, if required (Figure 8). The program will also be used in another department of the Board to disseminate information from site reports. A series of Assassin 'teach-ins' has been held for actual and potential users.

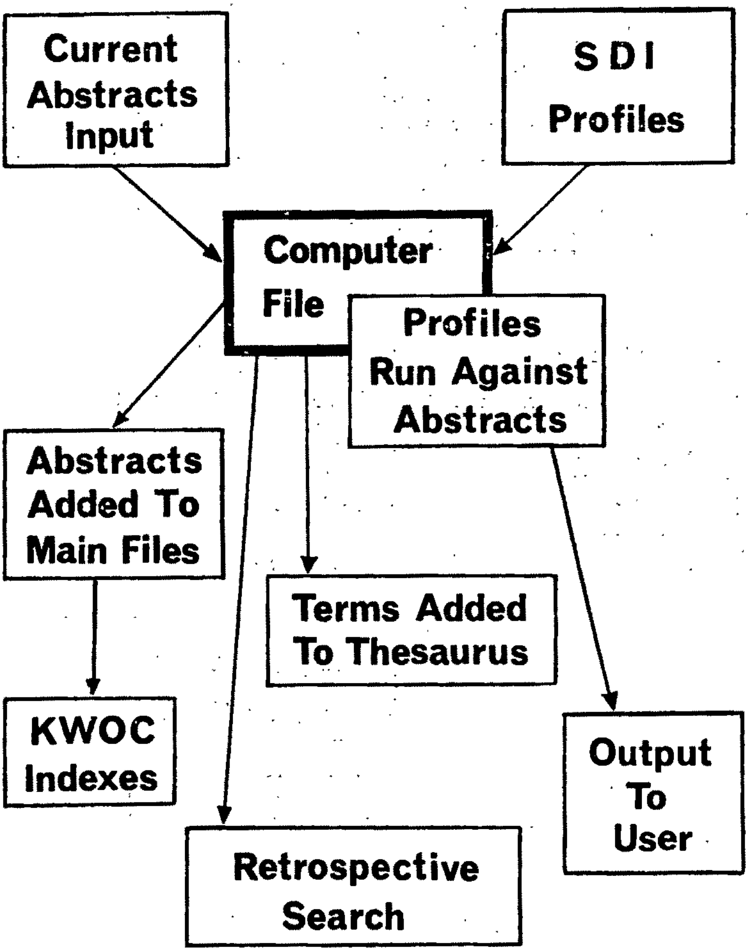


FIG. 8: *The CEGB computer based service*

The conversion from manual to computer based schemes is being performed gradually. The first part to be put on the computer was the SDI service, originally called Research Information Circulars, later expanded to Specific Information Circulars (SPICS). These have been converted to the Assassin system, and are being assimilated into the full, individually profiled, SDI service. Input at the moment is from the abstracts prepared for *Digest* and the supplements; CEGB reports, at present covered by manual abstracting, indexing and the *CEGB Reports List*, will be added in the near future.

A limited amount of retrospective searching is now being performed. As the information store grows this capability will become an increasingly valuable supplement to the considerable amount of manual searching which is now undertaken.

About half the present SDI users are involved in R & D. Ultimately it is intended to provide the service to the 13,000 or so potential technical and scientific users. Three staff in the search and mechanization section are working for about 20 per cent of their time on the major operation of profiling and conversion. Customers are interviewed to ensure that their listed interests are still current, and their interest profiles are then compiled. Something like 40 per cent of the HQ users have been converted, and about 500 staff are receiving output at the present time.

Input is from an IBM communicating magnetic card typewriter MC72 linked via a GPO modem (PO Datel Model 2) to the IBM 370/158-165 computer in Park Street Computing Bureau.

The present magnetic card machines are the third generation of 'tape'-typwriter equipment to be used by CEGB–HQ Information Services. In 1965 paper tape Vonomatics were introduced for use in the production of bulletins, etc. They were followed by IBM magnetic tape machines and have now been superseded by IBM magnetic card typewriters, which are used to process material for both the manual and computer based components of the service.

Services in the laboratories

So far the emphasis has been mainly on the Headquarters based services. To retrieve the balance, it may be appropriate to describe one of the information units operated in the Laboratories, taking the information section at Berkeley Nuclear Laboratories as an example. It is fairly typical of the smaller, but quite extensively used, services in that its growth, conveniently shown by the number of loans made per annum, has doubled in 5 years. (It is comforting to see that loans from stock have approximately quadrupled in the same period.) As Figure 5 has shown, the BNL information section is a small unit of 6–7 people. To provide an adequately comprehensive service, it has to rely considerably on involving its users as much as possible and it has been reasonably effective in so doing. For example, the customers are encouraged to operate a 'do-it-yourself under guidance' scheme. This has the obvious advantage of keeping the library staff to a minimum, but more important, it encourages direct user contact, so allowing the information staff and their customers to use each other's expertise. At Berkeley it is quite customary for the information staff to call upon the detailed subject knowledge of the users in such matters as book selection or in preparing bibliographies.

Of particular value are the strong information links, not only with colleagues in the electricity supply industry but also with those in the atomic energy world. Many reports are received from the United Kingdom Atomic Energy Authority establishments and this situation has influenced the decision to include AEA/ CEGB and other committee documents in the BNL reports stock.

Because of local requirements, individual laboratory services often have to cover less orthodox functions. At BNL for instance, the information officer and his staff are involved in such activities as publicizing the work of the establishment by organizing tours of the site for visitors and in operating the language training equipment. A third and quite major peripheral activity is the publishing of the research reports. Here editorial, reprographic and purely clerical work is involved (to the extent of more than one-sixth of the total information staff effort). The work is closely integrated with the more usual library functions with consequent advantages in the awareness of the laboratories' own reports, their handling and supply and the rationalization of available storage space. In its capacity as the publishing house, the library holds the hard copy spares of the laboratory reports as well as the customary library document collection.

As is often the case in industrial information units there are many activities of a non-routine nature. They include, for example, the negotiation of report exchange agreements, the problems of handling security classified documents and of ensuring uniformity of report handling procedures. Such matters are quite properly an integral part of the information function and may occupy a considerable portion of the available time. However, limitations of space and time preclude detailed consideration here.

Training

The training of research, operational, and other staff to use the information facilities is covered by various induction courses (including a special one for research officers) and the Board's information staff are involved in this activity. It has even been suggested that a short period of working with the library staff in the early days of new entrants would be beneficial. Certainly it is very important for research staff to know how to use the system efficiently.

Trade literature

The demand for catalogues and trade directories is well known. So is the debate on the question of where collections of this sort should be housed. In the CEGB, the full spectrum of solutions is to be found. In the regional scientific services departments, trade literature is usually kept in the library. On the other hand, London HQ and BNL pass it to another section such as Engineering Documents or Purchasing. The decision often depends on the size of the establishment and the availability of suitable storage space, for on a small site the only suitable place could well be the library; at the larger ones, however, a separate specialized home can be found. In many cases the libraries limit themselves to holding subscription services such as Technical Indexes, and pass manufacturers' material to the purchasing section. Probably it does not matter where the trade collection is housed, as long as it is maintained adequately.

Future development

It seems probable that considerable emphasis will continue to be placed on expanding the computer based HQ service to cover a much larger proportion of its potential users in both research and other fields. Probable developments include the distribution of KWOC indexes in COM form to outstation and other co-operating libraries, allied to an expansion of the retrospective search facility. The links between the component units of the CEGB Information network will be needed as before. Nevertheless, because of the differing requirements of the various research centres, the information services at the major research centres are likely to be required on an increasing scale; the supporting library facilities will need to grow to provide the hard copy material prompted by expanded SDI and retrospective search facilities. The advisory and liaison capabilities of the information staff in the research centres will continue to be called upon for, even with highly developed central services, there is no substitute for the personal touch.

To sum up, the picture is one of steady development of both central and research centre activities, with an increasing awareness of the contribution of information services to the effective running of the industry's research.

Acknowledgments

The author would like to thank his colleagues in the information services of the CEGB, in particular Mr R. W. Prior, for their help and constructive comments.

This paper is published by permission of the Central Electricity Generating Board.

REFERENCES

1 PRIOR, R. W. The Power Game: information bulletins for the Central Electricity Generating Board. *Aslib Proceedings*, 19 (12), December 1967, p. 424–9.

2 PARRY, A. A., LINFORD, R. G. *and* RICH, J. A. Computer literature searches—a comparison of the performance of two commercial systems in an interdisciplinary subject. *CEGB Report*, Berkeley Nuclear Laboratories, RD/B/N2915, February 1974.

British Gas R & D information services

R. E. Wiggins

British Gas Engineering Research Station

Paper presented at the Aslib Engineering Group conference on R & D Information Services in the Energy Industries, Geological Society of London, 25th–26th November 1974

1. Introduction

DRAMATIC CHANGES HAVE taken place in the UK gas industry, particularly within the last decade. It is therefore helpful to briefly consider these changes and the role of research and development within the industry so as to provide a backcloth to the subsequent descriptions of R & D information services.

1.1 *The nationalized gas industry*

The gas industry in Great Britain was taken into public ownership on 1 May 1949 under the 1948 Gas Act, which thereby created the Gas Council and the twelve Area Boards. The primary functions of the Boards were the manufacture, supply and sale of gas to consumers in Great Britain. The industry's central coordinating and advisory body was the Gas Council which had specific responsibilities for raising capital, conducting research and settling terms and conditions of employment. This legal framework for the industry's operations remained unchanged until 1965 when the Gas Council was given additional powers and duties to coordinate the development of the industry on a national basis and to manufacture or acquire gas in bulk and to sell it to the Area Boards or, in special circumstances, direct to consumers. These new powers enabled the Council to take full advantage of technical advances and new sources of gas which required to be developed on a national scale. The 1960s saw the industry pass through two technological revolutions, namely from one based on coal to oil and then to natural gas, the discoveries of which greatly increased the availability of gas for sale. Major reorganization of the Gas Council on a Divisional basis and complementary adaptation by Area Boards was commenced to cater for the industry's expansion. Shortly thereafter the Gas Act 1972 gave full statutory responsibility for the industry to a single authority, the British Gas Corporation, whose main duty is to develop and maintain an efficient, coordinated and economical system of gas supply for Great Britain and to satisfy, so far as it is economical to do so, all reasonable demands for gas.

The Headquarters of the Corporation maintained the organization established by the Gas Council whereby its activities are divided into six main Divisions: Production and Supply; Finance; Economic Planning; Marketing; Personnel; Research and Development.

Aslib Proceedings, 27 (4), April 1975, p. 154–167. Printed in Great Britain

1.2 *The research and development division*

Research planning

The Corporation has a statutory responsibility 'to settle from time to time in consultation with the Minister, a programme of research on matters affecting gas supply and other relevant matters'.

The research programme planning cycle is geared to that of the Corporation Plan and is carried out on a rolling 5-year basis. The end-user of R & D results is closely involved from the start in establishing objectives, priorities and time scales and each Division has Liaison Officers to facilitate these tasks. The proposed programme has to be approved by the Corporation's Executive Committee and then the Corporation who submit it annually to the Department of Energy where it is considered by the Minister's Advisory Council on Research and Development (ACORD).

The advice of independent eminent scientists on R & D policy is available to the Corporation from the Research Committee which is under the Chairmanship of the Corporation's Deputy Chairman.

Organization of the Division

The Research and Development Division, headed by the Director of Research at the R & D Headquarters in London, has about 1,300 staff and manual workers. Most are based at four Research Stations: Watson House and London Research Station, both in Fulham; Midlands Research Station in Solihull; and the Engineering Research Station in Killingworth near Newcastle upon Tyne.

The Research Directorate is responsible for ensuring that the Division's work is properly planned, controlled and reported through the Corporation's senior management and functional policy committees. It comprises the Director of Research and the four Station Directors. R & D Headquarters provides the necessary secretariat, coordinates the planning cycle and is responsible for patents, appropriate contacts with outside organizations and central administration.

The planned gross expenditure on research for the year 1974/5 is £8,500,000.

The work of the Research Stations is aligned to industry functions and problems with each Station, concentrating on certain specific areas.

The Engineering Research Station is concerned with high pressure gas transmission, storage and low pressure gas distribution with particular reference to mechanical engineering design, materials technology and control instrumentation. Emphasis is placed on the integrity and safety of the high pressure system. Work on gas distribution covers, for example, leak detection and repair methods, plastic pipe and fittings, joining of steel pipe, pipe laying equipment, corrosion, and the design of distribution systems and replacement policies.

The London Research Station provides scientific support to the production and treatment of natural gas and to the evaluation of the properties of gas through all stages of its exploitation. Associated work includes studies of processes for the production of substitute natural gas (SNG), investigations of leakage sealants and gas conditioning agents, and the development of analytical methods in anticipation of the Industry's needs. Mathematical and computing techniques are developed and applied to numerous operational problems, particularly with respect to the transmission and distribution of gas. Work on flames and combustion includes fundamental studies of flame reactions and stability, and investigation of ignition and detonation limits.

The Midlands Research Station is chiefly concerned with gas production and industrial and large scale commercial utilization of gas. The work on production is mainly devoted to the development of oil-based processes for the manufacture of SNG involving laboratory and pilot plant studies and technical support for existing and proposed plants. In the field of large-scale utilization, the principal basic topics are combustion and heat transfer. Linked to this is research into burner design and development and the establishment of techniques that ensure safe operation, especially through automated control systems. Applications being studied include gas firing in boilers, rapid heating furnaces, prime movers (engines) and sundry low temperature processes. Attention to the amenities involves work on noise and on combustion products.

Work at *Watson House* is centred on the domestic and small-scale commercial utilization of gas, and covers research and development, approval testing and the preparation of production, installation and quality control standards for appliances. Specific areas of investigation and expertise include thermal, environmental and reliability engineering, the physical and chemical mechanisms of combustion, properties of metals, ceramics and polymers used in appliances, and the design and development of components such as ignition controls, thermostats and burners.

2. R & D information services

2.1 *General information*

With the division of specialization between geographically separated Research Stations, local library and information units have been developed to serve the needs of the staff employed at each Station. The small R & D Headquarters establishment has local access to the library service at British Gas Headquarters, Marble Arch and, of course, to the Stations' units.

Although centralization of all library and information services at a location away from the Stations is not appropriate to the Division's organization, patent information and the protection of inventions are important exceptions. Thus the patents department at R & D Headquarters has a Patents Information Officer. He liaises with Station information staff and directs to them relevant British and United States patents and a more general patent abstracts bulletin. He also undertakes patent searches in the conveniently located Science Reference Library.

It is important to note, however that centralization of services, or certain aspects of them, does not necessarily involve an off-Station location. There are a growing number of areas where, for the sake of the 'end-user' or to avoid unnecessary duplication of effort, for example, it is more logical for one Station to take responsibility for a defined library or information activity. This may be desirable because the Station is the only one with the necessary hardware, staff or expertise and can hence undertake the work on behalf of all of R & D Division. In such cases it would be illogical as well as a waste of manpower and money either to let each Station expand its resources to undertake the duties or to set up a completely separate unit for the purpose. Examples of such division of responsibilities will be noted later when the services provided are considered in more detail.

2.2 *The collaborative approach*

This approach to R & D information services demands effective coordination of work and co-operation between Stations and Headquarters. Much of this is achieved informally on a day-to-day basis. The overall more formal approach, however, is conducted through a Research Liaison Panel on Scientific Information Services (RELIPOSIS) established in 1967. Membership comprises the Information Scientists heading the Research Station units, two representatives from R & D Headquarters and the Librarian of the British Gas HQ at Marble Arch. The Panel reports to the more recently established Research Administration Meeting (RAM) whose membership includes Assistant Directors responsible for Administration at the Stations and representatives from Headquarters and which itself reports to the Research Directorate.

The Liaison Panel's terms of reference are:

1. To provide for the exchange of expertise among information staff of the R & D Division, and to coordinate their activities in the information field;
2. To establish and maintain liaison in the field of information services between R & D Division and the rest of British Gas, and outside bodies;
3. To consider ways of improving the exchange of scientific and technical information between R & D Division and the rest of British Gas;
4. To consider the future function, organization and operation of information services in R & D Division;
5. To make recommendations to the Research Administration Meeting on the foregoing and on such other matters that come within the information function.

A programme of work, drawn up by the Panel and agreed to by RAM, comprises short- and long-term projects and is kept under review at meetings of RELIPOSIS and of RAM. Examples of items on the current programme which illustrate the range of subjects under discussion are computer produced indexes to Station reports, microfilming and a selective report dissemination service for British Gas staff. RELIPOSIS is also called upon to make recommendations to RAM on a wide spectrum of topics such as the incorporation of the British Gas scheme for document security classification into R & D Division procedures. Early results of the Panel's work have included establishing at the Marble Arch HQ Library a central index of translations made by Research Stations and Regions (the former Area Boards) and the exchange and adoption of ideas on Station reporting procedures.

It will be noted from the Panel's terms of reference and its work programme that the Stations' information units have, amongst others, two distinct but inter-connected duties. Firstly, they collect, organize and exploit relevant 'world' literature for the benefit of R & D staff and hence British Gas. Secondly, they are involved to varying extents in disseminating the results of R & D work to the end-user in British Gas and, as appropriate, outside through, for example, the International Consultancy Service of British Gas. The services provided and techniques employed under these two headings are considered in more detail later.

2.3 *Research station information units*

The R & D Division currently employs at its Research Stations 23 full-time qualified and clerical staff providing 'traditional' library and information services. This number excludes the head of each unit. The qualified staff include a proportion of science and engineering graduates, chartered librarians and information scientists, whose subject training matches the interests of the Station at which they work. However, because of the ways in which the individual units have evolved to meet the specific needs of their particular Station, the responsibilities, organization and number of staff at each site differ (Figure 1).

Station	**Person in charge**	**Number of Library and Information Staff**	**Additional responsibilities of unit involving other than Library and Information Staff**
Engineering Research Station	R. E. Wiggins Assistant Division Manager Information Group	5	Editorial duties, printing and photocopy services, central registry and photography, conference organization.
London Research Station	P. W. Graham Manager Information Services	6	Editorial duties, printing and photocopy services.
Midlands Research Station	D. Reay Head of Information and Publication	4	Editorial duties, organization of open days.
Watson House	R. Cooke Leader Scientific Information Centre	8	Editorial duties relating to Station reporting procedure

FIG. 1: *Staffing and activities of British Gas information units*

Engineering Research Station (ERS)

ERS, the newest of the four Research Stations, was established in the North East in 1966. An information scientist to take overall charge of the embryo Information Group joined the Station in 1967. Suitable administrative procedure and services had to be developed for the Station, and the Group became involved over the years, to a greater or lesser extent, in setting up and eventually taking charge of the post room and central filing of project and committee files, printing, photocopying and photographic facilities, Station reporting procedures, and the administration of conferences and courses.

From its inception, the Group has had the dual role of satisfying the local requirements of ERS staff in the areas outlined above, and of disseminating in an organized manner the results of R & D work outside the Station by way of various publications and the administration of conferences, courses and displays.

London Research Station (LRS)

The Information Services Division of the London Research Station has its origins in the library of the Gas Light and Coke Company established in the 1920s. An information scientist was appointed in 1967 and since then the unit and the services provided have been developed and expanded to meet the increasing demands of the Station.

The Division provides a library service dealing with the acquisition and storage of documents, an information section concerned with the storage, retrieval and dissemination of information mainly to Station staff, and a publications section that deals with the presentation, printing and distribution of material. The Division also plays a significant role in the dissemination of information to other parts of the gas industry.

Midlands Research Station (MRS)

A library has been in existence at the Midlands Research Station since its establishment at Solihull in 1958, but the information service is of more recent origin and dates from the appointment of the Station's first information scientist, in April 1967. Two important decisions taken during his time of office were to classify the bookstock, using UDC, and to begin a systematic storage and retrieval system for information relevant to the needs of the Station, using a post-coordinate index. A thesaurus was constructed and indexing started in February 1968. In November 1972 the activities of the Section were expanded to take in the publications service.

Watson House

This Research Station, whose roots go back to 1910 and the Gas Light and Coke Company, was in April 1966 the first of the four Research Stations to recruit an information scientist to take charge of its scientific information services which had been operating for several years. The Scientific Information Centre as it is now called is within the Administration and Services Division and was founded around the technical library mentioned above.

In addition to research and development it should be remembered that Watson House is heavily involved in such activities as approval testing of appliances and the preparation of production, installation and quality control standards. The outflow of information to British Gas HQ, the Regions, the gas industry and beyond from these areas of activity is the responsibility of three other Sections of the Administration and Services Division—the Information, Publications and Standardization Sections—most of whose operations fall outside the scope of this paper.

The Scientific Information Centre, on the other hand, has the primary function of obtaining, storing and disseminating—mainly to Watson House staff—the incoming scientific information related to their work. It comprises the Library and the Scientific Information Section.

2.4 *Collection and organization of information*

Sources of information

The work of each Research Station is aligned to particular industry functions and hence the library collections reflect these interests.

As with any scientific and technical library, much reliance is placed upon the basic sources of information such as periodicals, books and reports from commercial publishers, research associations and professional institutions, both in this country and abroad. Inevitably, however, a Public Corporation the size of British Gas has a complex and varied interaction with a wide range of organizations with which it exchanges scientific and technical information. It is therefore relevant to consider briefly the scope of these contacts as a guide to the types of sources employed.

Of special note in the UK public sector is the Coal, Electricity and Gas Research Liaison Committee comprising representatives from the three nationalized fuel industries. Its function is to provide a forum for discussion and information exchange on matters of common interest. Thus lists of research reports produced by the participating members are exchanged and specialized committees such as the Working Party on Materials Science meet regularly.

On another front the gas industry is intimately concerned with standards and codes of practice relating to its operations and the purchase of materials, equipment and skills. Hence staff from the Research and Development Division, and other Divisions within British Gas attend or are members of relevant committees of such bodies as the British Standards Institution (BSI), the International Standards Organization (ISO) and the Comité Européan de Normalisation (CEN).

Contact with the UK gas and energy industries in general is made for example through the Institution of Gas Engineers (IGE), the Society of British Gas Industries (SBGI), the Institute of Fuel and the Institute of Petroleum. All are concerned to a greater or lesser extent with the formulation and production of standards and codes of practices as well as with other professional activities—conferences, courses, etc.—to which British Gas contribute and from which they receive benefit and information.

Close liaison is maintained with the gas industries in other countries. The more formal ties are typified by the Atlantic Gas Research Exchange (AGRE), whose members are British Gas, the American Gas Association and Gaz de France, the European Gas Research Group (GERG) comprising gas industry representatives from the majority of the European countries, Marcogaz, an EEC body concerned with gas supply, and the International Gas Union (IGU) whose members are the national gas institutions.

Last but not least in importance are the many and varied sources of information within British Gas itself. Two areas are of particular significance to the Stations' information units. Firstly, there are the extensive committee structures within the Production and Supply and Marketing Divisions through which the

R & D Division receives, discusses and disseminates much of its information. Secondly, there is the report material produced within the 12 Regions of British Gas. Details of reports are supplied to the London Research Station who on behalf of R & D Division prepare a consolidated Regions' reports list for dissemination to the Division and all Regions.

Organization of information

Once acquired, the information in whatever form has to be organized for subsequent retrieval. Each Research Station library employs the ubiquitous UDC to classify its book stock. A Union List of periodicals is produced covering journals held by the libraries of the four Research Stations, British Gas Headquarters, and the IGE. The List, an early idea generated via the co-operative panel (RELIPOSIS) is prepared and issued every two years from Watson House.

For much of the other documentary material the Stations rely on separate indexes: post-coordinate, body punched card systems at the Engineering Research Station, Midlands Research Station and Watson House and a pre-coordinate computer-assisted system at London Research Station.

The possible advantages of adopting a common indexing vocabulary were considered soon after RELIPOSIS was established but the idea was rejected because of the considerable effort which would be needed to set it up, the changes that might be required in existing systems at some Stations and the fact that the subject interests of the Stations did not overlap to the extent where a single system would produce economies in effort. Even if established there would always be the problem with a single thesaurus of ensuring consistency of its use and coordination of its revision between physically separated locations.

The thesauri employed at the Midlands Research Station and Watson House were developed from scratch by relying mainly in the former case on the subject spread of the literature to be indexed and in the latter case on consultations with Station staff. At the Engineering Research Station the subject interests and hence the index terms required were largely covered by the English Electric Company's Thesaurofacet which was therefore adopted as a basis for the indexing vocabulary. All three post-coordinate indexes are operated manually although at the Engineering Research Station the vocabulary is being stored on the computer to aid updating and as a possible first step in full computer storage of the index for searching via a visual display unit. Computerization of library routines will be considered in detail at the same time.

At the London Research Station a pre-coordinate index was adopted in preference to a post-coordinate system largely because of the smaller staff effort required to develop and run it. The index terms comprise a combination of 'elements' and are ordered according to certain rules of relationship. Major elements represent general classes, minor elements items within the general classes while the subsidiary elements are adjectives. The index entries are sorted alphabetically in the computer which provides printed subject and name indexes.

The range of material covered by these Station indexes varies somewhat according to the scope of the literature scanning activity at each site and the requirements of the 'customers' being served. In general most library documents not classified according to the UDC are indexed. Journal scanning for items worthy of indexing, however, is more comprehensive at some Stations than others because of different local priorities and the availability or otherwise of suitable commercially available abstract journals in the relevant subject fields.

Watson House and the Midlands Research Station index their Station research reports on their post-coordinate systems. At the Engineering Research Station, however, printed subject, author and report number indexes were chosen at the outset because of the need expressed by their 'end-users' in British Gas for indexes they could consult locally in conjunction with the Station's Reports Lists they received. The index uses the KWOC (Keyword-out-of-context) layout and this approach was later adopted by the London Research Station. The report indexes of both Stations are compatible and the separate indexes can be merged—as may prove worthwhile in the future. The need for a widely distributed printed index to the Midlands Research Station and Watson House reports is not so great but the proven COIN package could be applied should the requirement arise.

In addition to documentary material, both Watson House and the Engineering Research Station maintain indexes to photographic material—slides and prints in the case of Watson House, slides and ciné film at the Engineering Research Station.

Microfilm is of growing significance at each Station. More suppliers of documents are making microfiche or film available. In-house microfilming is also being adopted to an increasing extent to facilitate the secure storage of documents and save space. Equipment for duplicating microfilm is available at the Engineering Research Station and Watson House.

2.5 *Services to research station staff*

The services provided at each Station are as far as possible tailored to meet the particular needs, location and organization of its staff. The information services can be divided into those for current awareness and those for retrospective searching and enquiry work.

Current awareness

A variety of current awareness services is available to Station staff, the most basic being of course the display and circulation of recently received journals and, at the Engineering Research Station and Watson House, the distribution of copies of journal contents pages. All Stations operate some form of literature scanning service which is integrated as appropriate with the indexing routines referred to previously. Basic information about the subject interests of staff is obtained from the Research Programme. This information is of course supplemented by that obtained from personal contact with staff.

At Watson House new items of information considered to be of current interest to project staff are assigned to the relevant group code card in the Termatrex post-coordinate system. The group code indicates the Group or Division at Watson House in which the potentially interested staff work. The cards are searched monthly and details of recently indexed documents are sent to the appropriate Group or individual. Feedback sheets are provided so that recipients can indicate the value or otherwise of the information received. A weekly current awareness bulletin, 'the Newsquick Service', covering technical news items is also circulated to staff.

At the Midlands Research Station selected indexed items are included in monthly bulletins angled towards the particular interest of five Station Divisions. Request slips in the bulletins enable staff to obtain items noted in their Division's publication.

External computer-based current awareness services have been employed with varying success at the Research Stations. Services subscribed to have included COMPENDEX (based on Engineering Index), UKCIS (based on Chemical Abstracts), ASCA (uses tapes prepared for Science Citation Index), and INSPEC (from the Institution of Electrical Engineers). The results of this experience are being pooled between Research Stations to facilitate reaching decisions on the benefits or otherwise of adopting these services both at Station and Divisional level.

None of these 'bought-in' services, however, effectively covers all the relevant literature received at the Stations. Hence the information scientists at London Research Station are experimenting with an abstracts bulletin slanted to the interests of their staff and continue to draw staffs' attention to potentially relevant items in journals.

As noted earlier, a comprehensive journal contents page copy service is operated at the Engineering Research Station. Literature scanning by information staff for SDI can therefore be restricted more to those publications such as foreign language journals and announcement bulletins which staff are unlikely to see or be able to read in the normal course of events.

Retrospective searching

The specialized indexes established at each station play an important role in giving access to previously published information when answering enquiries. Commercially available secondary publications such as Chemical Abstracts, Engineering Index and Gas Abstracts are also employed together with the usual network of national and international contacts established by and familiar to all who work in the special library and information field. One external computer-based service for retrospective searches which has been useful is RECON, operated collaboratively by EEC countries and based at the Government Technical Report Centre at St Mary Cray in Kent.

Post-coordinate index systems are not easily searched by the uninitiated. They are normally tools employed solely by library and information staff. The Engineering Research Station's plans to computerize their index were referred to earlier and are concerned both at overcoming this problem and at speeding up the indexing and retrieval operations. The printed format of the London Research Station index also has the benefit of personal access to offer to research staff.

Publications

In addition to the specialist SDI and current awareness publications previously mentioned there are certain basic publications produced by the information units for station staff. Thus each station issues lists of library accessions and of forthcoming meetings and exhibitions selected as being of interest to their own staff. Reports lists are issued regularly from each site for circulation within the R & D Division. Printed indexes to the lists of reports are produced at the Engineering Research and London Research Stations by the computer-assisted techniques described earlier. Details of openly published papers by Station staff are available and a single consolidated list of these is being prepared which will be updated and issued regularly.

The Station information units all play some part in assisting locally with the move to metrication within the industry as coordinated through the headquarters Metrication and Standards office. Various aids and publications are made available to staff including for example the 'SI Units and Conversions' booklet prepared for those at the Engineering Research Station.

Publications along with other services provided for British Gas staff outside the R & D division are considered in a later section of the paper.

Reporting procedures

Each information unit is responsible for administering its respective Station's reporting procedure. These lay down guidelines and rules covering, for example, the preparation, numbering, approval and availability of R & D reports and specifications and of papers for open publication.

Appropriate requirements laid down by headquarters and other departments are written into the procedures and include the British Gas scheme for security classification of documents. Editorial services are provided by the information units but their scope varies from Station to Station.

2.6 *Dissemination of* R *&* D *information to the end-user*

Expenditure on research and development is wasted if at the end of the line the results of the work are not effectively presented in the right form and provided at the right time to those for whom it is primarily intended—the end-users. Most of the projects in the industry's Research Programme are sponsored by the end-users, which in practice generally means the Production and Supply and Marketing Divisions.

Thus a major channel for disseminating and discussing the results of R & D work is the committee structure within these Divisions and the various interface committees between the end-users and R & D Division. The possible communication routes for R & D information range from this more structured system to the personal day-to-day contact between individuals in Stations, the Regions and operating Divisions.

Each station's information unit is closely involved in this information flow process, in most, if not all, of the following ways:

1. Dealing with enquiries received from outside and if necessary putting enquirers in contact with those research staff best able to help them;
2. Dissemination of report information;
3. Preparation of specialized newsletters and other publications;
4. Organization of conferences and courses.

Report information

Much of the report information reaches the end-user either directly on the report's initial distribution or via the appropriate committee. However, to help ensure that all potentially interested staff learn of available reports, abstract bulletins of reports approved for general distribution within British Gas are issued regularly by each Station. Last year the bulletins had a total initial distribution of 718 and covered 336 major reports. Printed indexes are available to the bulletins produced by the Engineering and London Research Stations.

From the point of view of the recipient, lists of reports have two main drawbacks. Firstly they are published up to several weeks later than the reports listed therein, and secondly, the recipient has to scan through the list to find reports of interest which he then has to request. In addition, reports themselves may not appear for several weeks after the information contained therein was formulated by the originator. A considerable length of time can therefore elapse before the potential user of the information receives it by way of report material.

To minimize such delays the Engineering Research Station instituted a selective dissemination service (SENDER) for their reports. Participating British Gas staff receive annually a list of R & D projects and project numbers from the current ERS programme and are invited to indicate by way of the numbers which are of interest to them. These stated interests are then matched with ERS reports as they become approved for distribution within British Gas. When registering, staff can ask for either full copies or summaries of reports or a combination of both to be sent.

The service has proved of benefit to British Gas staff chiefly because they only have to complete one simple annual registration form to receive, without further action, relevant report information soon after publication. Commencing next year, SENDER is to be extended to cover most 'engineering' end-users serviced by the Research Stations.

A single registration form and research project list will still be employed and returned to the Engineering Research Station who will pass on registration details to the participating Stations.

Other publications

The traditional research report is rarely the most suitable vehicle for transmitting research results to those in the field who have to assimilate and apply them. Increasing consideration in recent years has therefore been given to the form of presentation of such results in relation to the intended recipient. Thus welding engineers in the industry can receive *Welding Data Sheets* from the Engineering Research Station which contain just those facts and guidelines needed by the practising welder. The Engineering Research Station Information Group assisted in designing the layout of the *Sheets* and along with all reports is responsible for printing and despatching them.

On another level the Midlands Research Station information unit is involved in the production and distribution of two newsletters concerned with industrial and large scale commercial utilization. One is intended for circulation only within British Gas while the other shorter version is suitable for unrestricted circulation. Both consist of brief news items on new or on-going R & D work, forthcoming events, recent reports and papers and equipment newly certified by Midlands Research Station.

One of the major responsibilities of the publications section at the London Research Station is the editing and publication of the British Gas Analytical Methods Handbook and the Gas Data Book. Both of these are available for sale to the public.

As noted earlier much of the information disseminated from Watson House is not concerned with research and development and therefore falls outside the responsibility of the Station's Scientific Information Centre. Nevertheless the Centre maintains a watching brief on such matters as open publications and administers the Watson House reporting procedures which cover report information made available to British Gas.

Conferences and courses

A wide range of conferences, teach-ins, training courses, etc., is organized within the R & D Division for all levels of staff and not only those within British Gas. The events may for example be run by the Stations themselves or with the co-operation and under the auspices of a British Gas committee, the Institution of Gas Engineers or headquarter's training departments. Such meetings provide opportunities for person to person contact between research staff and the delegates. The resulting information flow, it should be noted, is not a one-way process and both Station staff and delegates benefit from the interchanges during discussions, practical exercises and syndicate work.

The degree of involvement of the different information units in the organization and administration of these events varies considerably. The Information Group at the Engineering Research Station is the most intimately concerned, being responsible for such matters as arranging accommodation and catering, printing and distributing papers and providing lecture theatre and projection facilities. At the London Research Station the Information Services Division organizes a regular LRS Teach-In. R & D information services formed the topic of one such meeting arranged for the Scientific Services Panel whose membership comprises representatives from all the Regions.

Research Station open days for a variety of visitors are periodically arranged. The Midlands Research Station, for instance, holds an open day three times a year for all levels of industrial utilization staff at Headquarters and in the Regions.

3. Future developments

Some of the possible future developments in services to Research Station staff and in the dissemination of R & D information from the Stations have been touched upon already.

Within the traditional library and information area increasing use of automated techniques is likely. Tape typewriters for reducing some aspects of typing and clerical work are being subjected to a more critical examination than has been undertaken before. Further computerization of indexes, library routines and current awareness services is being considered and introduced. In all areas of possible application, however, the real benefits must be clearly distinguished from the imaginary. Automation does not necessarily always reduce clerical effort or improve the quality and efficiency of services provided.

As regards the services to British Gas staff the aim is continually to improve upon current techniques of presenting and disseminating R & D information. In this task the Station information units have an important role to play. It is likely that selective dissemination of report information and the development of more digestable media such as newsletters will represent a significant proportion of their effort.

Acknowledgments
The author wishes to thank British Gas for permission to publish this paper. Grateful thanks are also due to his colleagues Mr P. W. Graham, Mr P. J. Tippen (LRS), Mr D. Reay (MRS) and R. Cooke (WH) for their assistance in providing material for this paper and for their constructive comments during its drafting.

Choose
your carpets
with confidence

from DODSON BULL
UP TO 30% DISCOUNT
ALL LEADING BRANDS
Wilton ● Axminster ● Oriental ● Tufted
• All makes available with full Manufacturers' Guarantees
• Free delivery in U K • Expert fitting service available
£200,000 carpets on display
in our extensive London and provincial showrooms
Free brochure on request to Dept. ALB
DODSON-BULL CARPET CO. LTD.

LONDON: 5 & 6, Old Bailey, EC4M 7JD. Tel: 01-248 7971
BIRMINGHAM: 164, Edmund St., B3 2HB. Tel: (021) 236 8862
BOURNEMOUTH: 268, Old Christchurch Rd., BH1 1PH. Tel: 21248
BRIGHTON: 2-5, North Road, BN1 1YA. Tel: 65402
BRISTOL 2-3 Royal London Hse, Queen Charlotte St: BS1 4EX. Tel: 28857
EXETER: 157, Fore St., EX4 3AT. Tel: 32019
GLASGOW: 166, Howard St., G1 4HA. Tel: (041) 221 3278
LEEDS: 12, Great George St., LS1 3DW. Tel: 41451
MANCHESTER: 55-61, Lever St., M1 1DE. Tel: (061) 236 3687/8/9
NEWCASTLE-upon-TYNE: 90-92, Pilgrim St., NE1 6SG. Tel: 20321/21428
WESTCLIFF-on-SEA: 495, London Rd., SS0 9LG. Tel: Southend 46569
Open: 9.00-5.30 Mon.-Fri., Sat. 9.00-12.00 (Manchester 9.00-4.00)

Technical information services at the BP Research Centre

D. G. Lee and P. F. Cole

BP Research Centre, Sunbury

Paper presented at the Aslib Engineering Group conference on R & D Information Services in the Energy Industries, Geological Society of London, 25th–26th November 1974

Introduction

BP RESEARCH CENTRE, Sunbury, is the principal research establishment of the BP Group and about half of BP's world-wide research is performed there. It was established in 1917 as a 'two men and a boy' operation in the basement of a house called 'Meadhurst' at Sunbury-on-Thames, some 14 miles west of London. From these humble beginnings it has expanded into an operation employing about 1,500 people, about one-third of whom are graduates in science or engineering.

The former Distillers' Company Research Centre at Epsom, about 15 miles away, is also administered from Sunbury. This employs another 350 people.

By far the largest organizational unit at Sunbury is that reporting to the Group Research and Development Department, but there is a separate Research Division reporting to Exploration and Production Department and certain special purpose units which are organizationally quite separate.

These separate units have their own information facilities, as has Epsom, but the whole of the Group Research and Development Department at Sunbury, consisting of four Technical Divisions with a total staff of above 1,000, is serviced by Technical Information Branch.

Technical information branch

In addition to offering technical information, library and technical records facilities, the Branch provides a range of clerical and administrative support services. These include the typing, reproduction, final clearance and issue of all formal Research Centre reports and the provision of photographic, tracing and photocopying facilities. Other Branch responsibilities include correspondence procedures, document security, organization of company conferences, arrangements for technical meetings and reception of technical visitors.

The strength of the Branch is 55. Its position in the Research Centre organization is shown in Figure 1.

Technical information facilities

1. Philosophy

We are convinced that the effective dissemination of information requires a

Aslib Proceedings, 27 (4), April 1975, p. 168–172. Printed in Great Britain

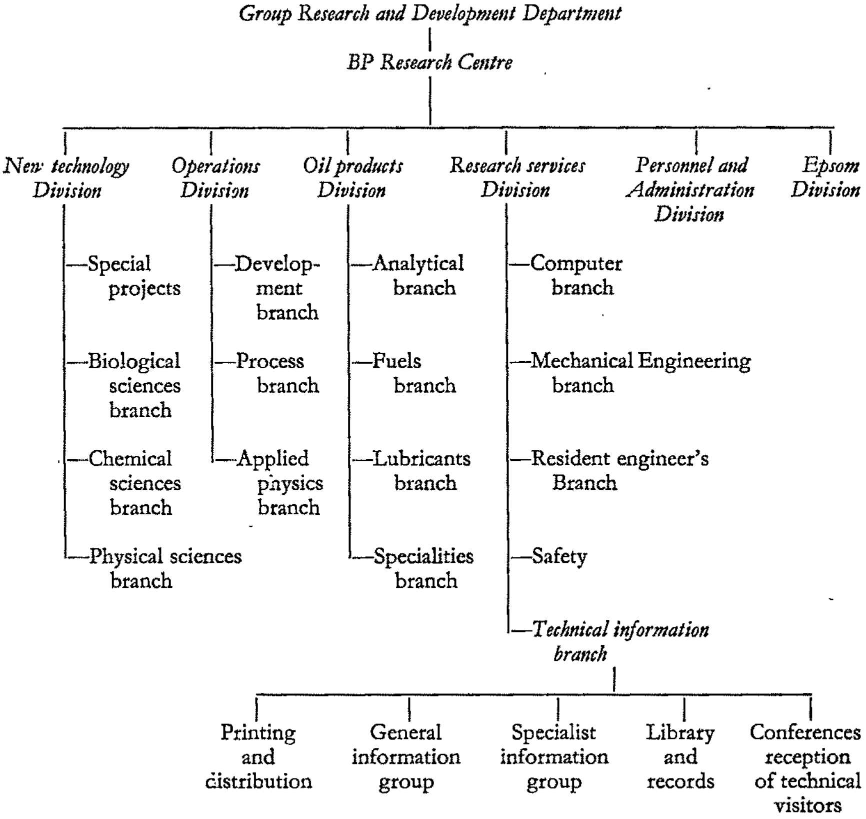

Group Research and Development Department
BP Research Centre
New technology Division
Operations Division
Oil products Division
Research services Division
Personnel and Administration Division
Epsom Division
—Special projects
—Biological sciences branch
—Chemical sciences branch
—Physical sciences branch
—Development branch
—Process branch
—Applied physics branch
—Analytical branch
—Fuels branch
—Lubricants branch
—Specialities branch
—Computer branch
—Mechanical Engineering branch
—Resident engineer's Branch
—Safety
—Technical information branch
Printing and distribution
General information group
Specialist information group
Library and records
Conferences reception of technical visitors

FIG. 1: *BP Research Centre Organization*

combination of selective and broad coverage. The rationale for this is that the two approaches satisfy different needs, with selective dissemination best suited to very specific interests originating from one or, at most, a few projects while broad coverage is appropriate for more general matters of interest to a larger number of projects.

The main emphasis is on selective dissemination direct to individual research projects of material actively sought out by graduate specialist information officers well briefed on the activities and interests of the projects concerned. This selective dissemination is supplemented by the widespread circulation of a range of bulletins, some purchased and some produced internally. We subscribe to the Central Abstracting Service of the American Petroleum Institute (API) and their weekly bulletins of literature and patent abstracts are given a wide circulation within the company. In addition, we circulate internally prepared bulletins listing the books and pamphlets received by our library and the reports received by our technical records unit. We also prepare and circulate bulletins of literature abstracts which supplement the API literature abstracts and, at longer intervals, lists of forthcoming scientific and technical conferences and exhibitions.

The personnel who provide our information services are organized into two separate groups:

Specialist information.
General information.

2. Specialist information group

The Specialist information group consists of mature, subject qualified graduates, each specializing in a particular technical area and serving a number of assigned projects. A knowledge of the activities and interests of each is built up by continuing personal contact (especially with the head of the unit) backed up by attendance at suitable meetings, perusal of progress reports, correspondence and other relevant documents.

On the basis of this background knowledge, the specialist information officer actively searches out and directs to projects information relevant to their operations. Whenever possible, project needs are anticipated by intelligent extrapolation of their current activities and interests.

An important part of this service is the retrieval of specific information by means of literature searches and the presentation of the search results in the format best suited to the particular enquiry.

State-of-the-art reviews are reserved for the more important searches, with less sophisticated presentations for run-of-the-mill enquiries where speed is the prime requirement. When only a few relevant items are retrieved, a memo is prepared describing what has been found and indicating its relevance to the subject of the search.

The production of bibliographies makes relatively small demands upon time or expertise but the product is generally much less satisfactory than a review when the need is for specific information in a technological field. This is because the review presents critically evaluated information in a continuous prose form which offers scope for placing everything within a meaningful context, for emphasizing aspects of particular interest to the enquirer and for incorporating information from unpublished sources.

3. General information group

This group provides the following services:

(a) Current awareness

Weekly bulletins of *API Abstracts of Refining Literature* and *API Patent Alerts* are circulated throughout the Research Centre, and some are sent to other company centres. The literature bulletins contain informative abstracts of scientific articles and technical news items from about 150 English and foreign language periodicals supplemented by further material obtained under licence from Chemical Abstracts. Approximately 25,000 abstracts of pertinent literature on petroleum refining and research, petroleum chemicals, economics and statistics are produced annually.

In addition an internal abstract bulletin, which supplements the API material, is compiled and circulated bi-monthly.

(b) Central Information Index of Abstracts

This index, built up over the last nine years, at present contains about 250,000 abstracts. The bulk of the information is obtained from the API in the form of abstract cards, backed up by Alphabetical Subject Indices (ASI) and Dual Dictionaries. These are supplemented by internally prepared abstracts of articles appearing in journals not considered by the API. About 1,200 such abstracts are prepared every year, the total to date numbering about 9,000. The API abstracts are also available on magnetic tape for computer searching; this service is used when the magnitude of the task justifies it. For major searches, we also employ the longer established search aids, such as Chemical Abstracts, Engineering Index or Motor Industry Research Association (UK) (MIRA) Abstracts, as appropriate.

(c) Report subject indexing

The subject indexing of company-generated reports is undertaken by General information group, who use optical coincidence cards as the indexing medium. This index is also consolidated into our computer-generated ASIs and Dual Dictionaries.

(d) Translations

One of the general information officers possesses considerable linguistic ability, and is able to offer 'on-the-spot' translations of the technically significant portions of foreign language papers. This enables project personnel to assess whether translation of the full paper can be justified. Before contracting out a translation, a check is made of the existing centralized indices—the Commonwealth Index of Scientific and Technical Translations, maintained by Aslib, and the British Lending Library (BLL) Index of Russian and E. European Languages to see whether a copy is already available.

4. The two types of Information Officer

It will be evident from what has already been said that two types of information officer are employed at the Research Centre, the Specialist and the Generalist. This situation has arisen because of two factors; (1) the continually expanding output of technical literature, and (2) the ever increasing sophistication of information and retrieval techniques. The first of these factors makes it increasingly difficult for subject experts to keep abreast of new developments and leads to demands for greater support in the form of expanded current awareness programmes, more selective dissemination of information and the provision of packaged, pre-digested information on demand. Secondly, the effort required to keep abreast of new developments in information and retrieval techniques results in a reduction in the time available to the information officer for the establishment of an adequate technical background and could easily lead to a corresponding reduction in his effectiveness.

One obvious solution to this problem is the establishment of two separate information officer functions. One of these, the Specialist, concentrates on the evaluation, correlation and presentation of technical data; the other, the Generalist, on information and retrieval techniques. These two functions are complementary, the Specialist often having recourse to his Generalist colleague when collecting raw material for subject reviews or when evaluating foreign language literature. The Generalist, in his turn, often calls upon the Specialist with his more detailed subject background, to advise on the selection of material for inclusion in our Central Information Index or in circulating abstract bulletins.

Library

1. Books

Our library holds a book stock of about 12,000 volumes, principally concerned with petroleum technology, chemistry, chemical engineering, physics, mathematics, engineering and allied sciences. In addition, other topics such as environmental problems and research management are represented. The majority of books may be borrowed, but a representative collection of standard texts is available for reference only.

2. Pamphlets

A pamphlet collection of some 30,000 published items is available for loan. This collection includes preprints of papers from meetings and conferences held by the IP, API, ACS, AIChE, etc., technical articles, reports, trade literature and Government papers. Retrieval is by means of subject and author card indexes, but some pamphlets of more permanent value are also exhaustively indexed and included in our Central Information Index.

3. Periodicals

Some 700 current periodicals are received, and most of these are circulated, first to the information officers, then to other interested parties. Reference copies of the more important journals are on display. After circulation, about 200 of the most used journals are bound and shelved, while the remainder are retained in unbound form for periods varying from one to five years, depending on their importance. After circulation, all journals other than reference copies are available for loan.

4. Other facilities

Other published information held includes patent specifications, standards, Government and published industrial specifications. Microreading and copying facilities are provided for microfilm (*e.g.* Chemical Abstracts), microfiche and microcards. Items not held by the library are obtained when required from one of the outside loan services, such as the BLL, the Government Reports Centre, or other special libraries.

No slick answers?—library resources to serve the offshore oil industry

R. J. Ardern

Librarian, Highlands and Islands Development Board

Paper was presented at the Aslib Transport and Planning Group Planning Exchange Joint Conference on Information for Oil, Edinburgh, 12th November 1974

The offshore oil industry is making a profound impact on different parts of the British Isles. It is only three years since Scotland advanced into the oil age with the proving of the Forties field, and a similar process may soon follow around the Celtic Sea area. Many difficult decisions and adjustments have to be made (both onshore and offshore) in the fields of employment, planning, the provision of infrastructure, marine engineering, offshore supply and transport.

In such a fast-moving industry information provision is of paramount importance, but the speed of development makes it all the more difficult to achieve. This paper attempts to aid decision making by showing what information is available in published form, and by discussing some of the available sources of unpublished data. The writer's own attempts to fill some of the information gaps are discussed and some basic acquisitions are recommended for anyone starting to build up a collection on offshore oil.

Introduction

MY TITLE 'No slick answers?' is largely meant to reflect the rapid development of the United Kingdom offshore oil industry over the last three years. The situation is constantly evolving so that it is impossible to write any definitive text which will not be far out of date by the time it is published.

The title also reflects, in part, my own position in giving this paper, for I do not claim to be an expert on the subject, as I am not working full time on oil, but have to keep up with a very wide range of other subjects in my own library. Neither do I claim this paper to be comprehensive. I am only too conscious of the large amount of material I have had to leave out. In the offshore field, most of us are still learning, and I hope myself to learn a lot from the other speakers and from the discussion.

It is perhaps important to start by defining my terms. Although this conference is convened by the Aslib Transport and *Planning* Group, and by the *Planning* Exchange, I do not intend to confine myself to onshore planning aspects which, I submit, cannot be understood without an awareness of the offshore situation and the technical difficulties encountered there. All the technical evidence given at the Drumbuie Enquiry provides a good illustration of this point.

After a brief, in context, statement of the Highland Board's role in the oil business as an aid to understanding my own library involvement, I propose to deal with the different types of literature available, with some of the information

Aslib Proceedings, 27 (4), April 1975, p. 173–184. Printed in Great Britain

sources, and then with my own attempts to fill a few of the information gaps, before finishing with a few suggestions for anyone just starting to build up a collection on offshore oil.

The Highlands and Islands Development Board and oil

As most of you will know, the HIDB was set up by statute in 1965 in order to assist the people of the Highlands and Islands to improve their economic and social conditions and to enable the Highlands and Islands to play a more effective part in the economic and social development of the nation.

In the six years to the end of 1971, steady progress had been achieved, particularly in attracting manufacturing industry, revitalizing fisheries, and developing tourism. Migration and unemployment rates were being reduced and general prosperity was increasing. This progress has continued, but late in 1971, only three years ago—a point I want to stress—the offshore oil industry emerged as a new economic force on the Highland scene. Late in 1971, with the proving of large reserves of oil in the Forties Field, and with the extension of exploration to the area east of the Shetlands, the Highland coastline began to be examined for suitable sites for land-based developments such as supply bases in Shetland and platform construction yards around the Moray Firth.

Besides being a newcomer, oil-related industry is already a more powerful economic force within the region, injecting capital at a rate conservatively estimated at £30 million compared to the Board's own involvement in a total of £11 million comprising direct (Board assistance) and induced investment in oil and other fields during 1973. Oil is a national imperative and it and its associated industries seek their own best locations to further their own aims. In an area as diverse as the Highlands and Islands there are some developments which could be inappropriate in particular areas, and it is the Board's job as a regional development agency additionally charged 'to have regard to the desirability of preserving the beauty of the scenery' (of the Highlands and Islands) to help maximize the long- and short-term advantages which might accrue to the area, while trying to prevent economic, social and environmental disadvantages from occurring.

To do this the Board acts in three main ways: in monitoring the needs of the oil companies; stimulating the development of supporting industries; and by providing a regional intelligence service, locational guidance and introductions to local authorities. The Board thus has an extensive network of contacts in the oil and oil-related industries, in relevant Government departments and with other bodies such as research institutes. It can therefore keep itself fully informed on the plans and requirements of the oil industry, appropriate details of which can be passed on to potential supporting industries which the Board may be able to help financially.

Regional intelligence services take many forms such as commissioned reports on harbours throughout the area, or the internally produced register of coastal sites which is a painstaking collation of all known and observed physical features of forty-two sites which might attract coastal development interests. The Board has also been active in forecasting future population growth and housing needs, and on the basis of some of these forecasts it commissioned and published a report on the likely future transport infrastructure requirements between the Moray Firth area and the south. The Board issues a periodic offshore directory which lists oil-related firms within the Highlands and Islands, and the oil industry is featured from time to time in regular publications such as the journal *North 7*. With the aid of internally produced maps and statistics, Board staff are able to lecture to groups of visiting industrial and regional executives (including several from the Celtic Sea area in recent weeks), and present an overview of the whole oil development situation throughout the Highlands and Islands. Staff have also participated in impact studies relating to specific development proposals and have made contributions to seminars and publications.

Oil development is therefore an important part of the Board's work, although because many projects are too large for Board financial involvement, only a relatively small proportion of our total aid is given to oil-related enterprises. The work goes on elsewhere in industrial development, fisheries, agriculture, tourism, and indeed in the whole continuum of regional development, and this wide range of subject interest, of which oil is only a part, is reflected in the work of the Library also.

Types of literature available

Rather than describe chronologically the development of the oil section of the Board's library, I propose to ignore the time dimension and give you a brief synopsis of what is now available within certain classes of literature. Due to the immediacy of much offshore information which renders the current awareness type of publication of much more immediate value than the basic text book or regional survey, I propose to adopt the following order—periodicals (including abstracts and indexes), conference proceedings, directories and yearbooks, legislation and codes of practice, basic texts, commissioned reports, and bibliographies.

Starting with periodicals. The most frequent of these are, of course, the daily newspapers, many of which run regular surveys on the offshore industry which can be usefully retained for future reference. Examples are to be found in *The Scotsman* (its Oil Register is published quarterly), in the *Financial Times* and in the Aberdeen *Press and Journal*. Next most current are the oil digests which specialize in providing weekly, fortnightly or monthly summaries of news about the oil industry. Two of these are weekly, the *Oil News Service Newsletter*, published in Glasgow since early 1972, and the *Weekly Oil Digest* which commenced publication in Glasgow in July 1974. The longest established of the fortnightly digests is the *Northern Oil Digest*, published in Aberdeen since May 1973, while the *Financial Times North Sea Letter* is a newcomer published in London since July 1974. The monthly *Petroleum Economist* (formerly *Petroleum Press Service*) was established in 1934 and covers events in the petroleum industry on a world-wide basis, and also includes a page of up-to-date statistics.

There are a good many periodicals serving the petroleum industry, and a representative list of titles would include the *Marine Engineers Review*, *Noroil*, *Ocean Industry*, *Offshore*, *Offshore Services*, *Oil and Gas Journal*, *Oilman*, *Petroleum Review*, *Petroleum Times* and *World Petroleum*. These could be supplemented by certain journals dealing with pollution, such as *Environmental Pollution* and

Marine Pollution Bulletin and by other more general periodicals, notably *Trade and Industry* which gives the government side of the story. For the planner, however, there is no journal devoted solely to the planning aspects of the offshore oil industry. From time to time, articles will occur in the major planning journals such as *Built Environment* and the *Planner*, but it is equally true that special surveys have appeared in a vast range and number of periodicals including *Architects Journal*, *Investors Chronicle*, *New Civil Engineer* and *Norway Exports* to name just a few.

To bring all these strands together, we either have to subscribe to all journals of possible relevance, and, more importantly, see that they are all read and abstracted or indexed, or, more likely, we have to subscribe to the main journals in our field of interest and rely on the commercially published abstracting and indexing services.

Again, as with periodicals, abstracts and indexes are quite well developed on the technical side, some of the most useful being *British Ship Research Association Journal of Abstracts*, *Deep Sea Research and Oceanographic Abstracts*, *International Petroleum Abstracts* (formerly *Institute of Petroleum Abstracts*), *Offshore Abstracts* (a newcomer in January 1974) and *Underwater Information Bulletin.* Use will, of course, also be made of *Current Contents—Engineering and Technology* and of *Engineering Index* and *British Technology Index.*

On the planning side, *British Humanities Index*, the *Department of the Environment Library Bulletin*, the Greater London Council's *Urban Abstracts*, and the Royal Institution of Chartered Surveyors' *Library Information Service* (formerly *Technical Information Service*) are all good standbys. *Geo Abstracts* is another possible source, particularly part C, Economic Geography, under the heading Energy. Since the demise of the *Glasgow Herald Index*, *The Times* is the only newspaper which now publishes its own index. *British Humanities Index* and the *RICS Library Information Service* do include much material from newspapers, but perhaps the handiest source for newspaper articles is Edinburgh College of Commerce Library's annual publication since 1972 *North Sea Oil: A Select List of Periodical and Newspaper Articles.* This indexes all the major newspapers, some of the oil digests and selected periodicals. Arrangement is by title within broad subject classes, and there is an index of people, places, companies and organizations.

Turning next to conference proceedings as being perhaps the next most up-to-date source—at least when the papers are given, although not always when they are published! Here, bibliographical control is relatively easy with the British Library's *Monthly Index of Conference Proceedings received by the BLL*, and the recently published ten-year cumulation (1964–1973) which contains details of 46,500 conferences under 27,500 different keyword headings. In 1972 we were all looking ahead and trying to predict exactly what would happen, it was a vintage year for conferences and I should like to mention just three. *Oil and Scotland's future* was the second international forum of the Scottish Council (Development and Industry). It was followed later in the year by *Scottish North Sea Oil—challenge and opportunity for industry and finance*, published by the Bank of Scotland, and the *North Sea Conferences 1 and 2* sponsored by the *Financial Times* and the *Petroleum Times* and published in 1973 by IPC.

Conferences were not confined to 1972, of course, and no doubt future bibliographers will be referred to the proceedings of the Information for Oil Conference, Edinburgh, 1974!

Dealing next with directories and yearbooks; these are a most convenient source for obtaining quick facts or a rapid general overview of the field. The uninitiated should have beside him the Institute of Petroleum's *Glossary of petroleum terms*, 4th ed., 1967. A world-wide coverage of oil company activities is provided by the *Financial Times' Oil and gas international yearbook*, while more locally, one can choose between the *North Sea oil directory*, 3rd ed., 1974/5 or the *UK offshore oil and gas yearbook*, 1st ed., 1974/5, Kogan Page, 1974. There are several directories dealing with equipment and supplies such as the *Guide to British offshore supplies 1974* (produced by the *Petroleum Times* and the Department of Trade and Industry), the *Underwater engineering directory 1973/4*, the *Norwegian offshore index*, 1st ed., 1974 and from America, the *Offshore contractors and equipment directory*, 5th ed., 1973, while both NESDA (the North East Scotland Development Authority) and the HIDB have produced local lists of firms engaged in, or supplying the offshore industry. Finally, another comprehensive source of information is the *International petroleum encyclopaedia 1974* published by the Petroleum Publishing Company.

Sources of statistics tend to be either yearbooks or periodicals. On the consumption side we could mention the Department of Energy's *Energy Trends* and the annual *United Kingdom energy statistics*. Forecasts of future production from the North Sea are contained in the annual brown paper *Production and reserves of oil and gas in the United Kingdom* published in May each year by the Department of Energy. This also contains a useful historical list of commercial discoveries to date.

The basic legislation which concerns us is the *Petroleum (Production) Act 1934*, the *Continental Shelf Act 1964*, the *Mineral Workings (Offshore Installations) Act 1971*, the *Prevention of Oil Pollution Act 1971* and, of course, the *Town and Country Planning (Scotland) Act 1972*. The last two are consolidated acts. It is under the *Continental Shelf Act 1964* that all the licensing arrangements have been made, and these can be referred to in the annual reports on the workings of the act which are available in the House of Commons Papers series. Stemming from the 1934 act are the *Petroleum (Production) Regulations, 1966* (S I no. 898), and stemming from the Mineral Workings Act are other regulations concerning the working of rigs at sea.

For comparative purposes, a document entitled *Legislation concerning the Norwegian continental shelf* (unofficial English translation) can be obtained through the Norwegian Consulate in Glasgow, together with other interesting documents on the situation in Norway on subjects such as the petroleum industry in Norwegian society, and the landing of petroleum from the Ekofisk area.

Apart from the various British standards for materials and equipment, there are several relevant codes of practice concerning the offshore industry. The Department of Energy have issued *Guidance on the design and construction of offshore installations*, HMSO, 1974, while both Lloyd's Register of Shipping (1972) and Det Norske Veritas (1973) have published a title *Rules for the construction and classification of mobile offshore units*. On the production side, the

Institute of Petroleum has produced its *Model code of safe practice* in ten parts since 1965, and *part 8 Drilling and production in marine areas* went into its second edition in 1972.

I do not propose to say much about the basic texts, as these can all be found in one of the bibliographies I shall be mentioning later. However, there are four recent general surveys which I would like to mention. The first is J. A. Steers's *The coastline of Scotland*, Cambridge University Press, 1973. Written from the geomorphological point of view, this is a comprehensive text based on over twenty years' work which contains much background material relevant to the offshore oil situation. Another useful work of reference is the *Scottish Office Brief on North Sea oil* issued by the Scottish Information Office in October 1973. This publication describes the various government departments and committees dealing with oil and gives a brief survey of all the oil developments to date of publication.

A similar survey of developments was also given earlier in the special North Sea oil number of the *Scottish Economic Bulletin* issued in May 1973, and the whole scene has been admirably surveyed and collated in the Royal Scottish Geographical Society's Teachers Bulletin no. 5 entitled *Scotland and oil*, edited by A. MacG. Hutcheson and H. D. Smith and published in February 1974. It is difficult to write a state of the art review of such a rapidly expanding field, but this publication has done a first class job and records development up to the end of August 1973 with a 'stop press' section recording events up to November 1973. I understand that a new edition is planned for September 1975. The main chapter headings are world demand, supply and prospects; the physical setting; the offshore industry—the sequence of events; the onshore industry—the impact on the economy; regional geography; and the emerging issues.

This brings us on to commissioned reports, mainly planning and impact studies which occur on two scales, the national and the local (or sometimes regional). Not all of the impact studies I shall mention will be generally available, due either to reasons of confidentiality, or of physical production in only small numbers sufficient for the needs of the originating body. Impact studies have been carried out internally in central and local government departments for many years, but were formerly nothing more than working documents which did not achieve general release. The existence of the Planning Exchange in Glasgow, and the continuance from there of the experimental information service for planners run last winter from the Planning Research Unit of Edinburgh University (if this should prove possible) could usefully extend the knowledge and availability of such studies.

Many of the national studies have emanated from the Scottish Office and I have no doubt that Mr Lyddon will have dealt with the two discussion papers on platform construction sites and on coastal planning, together with the recently published refinement of the latter namely, *North Sea oil and gas coastal planning guidelines*. He may also have mentioned *North Sea oil and the environment. A report to the Oil Development Council for Scotland*, HMSO, 1974. This is really more of a planning document, suggesting possible future policy, than an environmental catalogue.

On the social side, the Church of Scotland have published an interesting survey of attitudes entitled *Scotland in turmoil: A social and environmental assessment of the impact of North Sea oil and gas on communities in the North of Scotland* by J. Francis and N. Swan, 1973. The same authors followed this up in 1974 with *Scotland's pipedream: a study of the growth of Peterhead in response to the North Sea oil and gas industry.*

All of the local impact studies have been produced in response to specific development proposals such as the famous Drumbuie proposal which occasioned the widely followed public inquiry. The original impact study here was commissioned by the Scottish Development Department from Sphere Environmental Consultants and their final report dated August 1973 was entitled *Impact analysis. Oil platform construction at Loch Carron.* As the inquiry progressed and the issues widened, two more reports were commissioned, one by the Scottish Development Department again from Sphere and one by the Department of Energy from Crouch and Hogg. Both reports were completed in March 1974 under the titles *Loch Carron area. Comparative analysis of platform construction sites,* and *Gravity platforms. Detailed study of construction sites in the area of Loch Carron* respectively. The latter was, of course, more of a feasibility study than an impact study. In the interval between the two Sphere studies, the same firm were also commissioned to do an impact study of the proposed Ullapool development, and although this scheme was dropped soon afterwards, the report was, in fact, completed.

Another impact study dealing with a fabrication proposal is called *Planning application by Messrs Fred Olsen Limited at Arnish Point, Stornoway. Impact Study.* This was completed in March 1974 by Ross and Cromarty County Planning Department with assistance from the HIDB. A wide-ranging survey of sites in the Clyde area was completed in July 1974 for the Scottish Development Department and the Department of Energy by the Jack Holmes Planning Group under the title *An examination of sites for gravity platform construction on the Clyde estuary.*

Other applications for large scale developments have concerned not platform fabrication, but refineries and tank farms or oil storage depots. Zetland County Council's bid to confine oil development largely to the Sullom Voe area received statutory approval in the *Zetland County Council Act 1974.* While the bill was being debated Livesey and Henderson were commissioned to draw up a development plan for the area. The report, in six volumes, was published in October 1973 as *Sullom Voe and Swarbacks Minn area. Master development plan and report related to oil industry requirements.* In Orkney, similar planning controls over a more limited area have been written in to the *Orkney County Council Act 1974.* The Occidental Petroleum Company who are building a tank farm on Flotta have received a report commissioned from W. J. Cairns and Associates entitled *Flotta, Orkney, Oil handling terminal: an environmental assessment 1973.* Further south, at Nigg, in Easter Ross, a refinery proposal has engendered another impact study completed by Ross and Cromarty County Council Planning Department in June 1974.

The Moray Firth area, in fact, is becoming well documented by recent plans and impact studies going back to the Jack Holmes study of 1968. This was commissioned by the HIDB and its title is *The Moray Firth area—a plan for* *growth in a sub-region of the Scottish Highlands.* It was basically a capacity study to see what increase of population the area could absorb and where. Although far sighted when conceived it has proved extremely useful in the last few years when planning has been going on for considerable population growth.

The establishment of British Aluminium's Invergordon Smelter spawned a number of impact studies which were conceived early enough to be able to monitor the development right through the entire construction phase to full production. With a similar economic study in Anglesey they are possibly the first comprehensive impact studies to monitor from the start the impact of the introduction of a large manufacturing industry into a rural area. In the Invergordon case, there are three parallel studies: economic; sociological; and ecological, all being carried out by academics from Aberdeen University. Interim reports have been produced to date, and the final reports should be completed during 1975. These studies are important in the oil context in that the expertise built up has been turned to good use elsewhere. The Aberdeen economists are currently carrying out a big research study commissioned by the Scottish Office on the impact of North Sea oil on the Scottish economy, while the Aberdeen geographers are completing a series of reports for the Countryside Commission for Scotland on the beaches of the Highlands and Islands and they have also assembled ecological evidence relating to proposed developments such as at Dunnet Bay in Caithness and at the Loch of Strathbeg in Aberdeenshire.

Probably largely due to oil, there has been a renewed interest in the north in updating the county development plans. Two reviews were published during 1973, one for Sutherland by the Jack Holmes Planning Group, and an interim review for Orkney compiled by Moira and Moira, while in 1974 there have appeared so far an interim report on Caithness by Wilson and Womersley, draft district plans in Shetland for Yell and Unst by Llewelyn-Davies, Weeks, Forestier-Walker and Bor together with a Sullom Voe district plan following on the Livesey and Henderson report mentioned above. Scotland, apart from the Highlands and Islands has been well covered by sub-regional plans in the last ten years culminating in the recently published *West Central Scotland plan.* Two sub-regional plans providing background information for the main oil development areas are *North East Scotland—a survey of its development potential* by M. Gaskin, HMSO, 1969 and *Tayside—potential for development* by A. D. Campbell and W. D. C. Lyddon, HMSO, 1970.

Transport and harbour studies relevant to oil range from the SCDI's *Oceanspan* published in two volumes in 1970 and 1971 on the national scale, to the Babtie Shaw and Morton surveys of potential offshore supply bases in the Highlands and Islands and the A. M. Vorhees' *Moray Firth Access Transport Study*, HIDB, 1974 commissioned by the HIDB.

On the environmental side, the number of applications for industrial development sites along the Cromarty Firth in particular, must have been a factor in persuading the Nature Conservancy to compile and publish in 1973 *A prospectus for nature conservation within the Moray Firth.* Taken with the Aberdeen University *Moray Firth ecological study* the area's flora and fauna are now well recorded, and changes continue to be monitored. The Nature Conservancy Council have also focused their attention on Shetland and have published the proceedings of a January 1974 symposium under the title *The natural environment of Shetland* edited by R. Goodier. A shorter, unconnected report was also published in 1974 by University College, London entitled *A proposed nature conservation plan for Shetland* by A. Warren and C. M. Harrison. Further south, in May 1974, the NERC published *The Clyde estuary and firth: an assessment of present knowledge* compiled by members of the Clyde Study Group.

Finally, in this section on the literature, I want to consider the available bibliographies and the indexes to reports. (We have already mentioned the available abstracts and indexes to periodical articles.)

There is one particularly useful general bibliography and that is *Oil: a bibliography based on items relating to the offshore oil industry held in the libraries in the North East of Scotland*, 2nd ed., 1974, compiled by Penelope Shepherd and published by ANSLICS, the Aberdeen and North of Scotland Library and Information Co-operative Service. Containing over 600 references to books and reports and listing over 100 periodicals, the entries are culled from fifteen separate libraries, university, public, educational and special, located between Aberdeen and Inverness, whose combined wealth go to make the bibliography highly comprehensive. The bibliography is arranged in the following sections: general background; economic and political aspects; management, planning and safety aspects; North Sea oil and its impact; petroleum geology and exploration; oceanography; ocean engineering; extraction and drilling; transportation, storage and distribution; processing, refining and use; environmental and pollution aspects; periodicals; and non-book materials. There is an author and title index. It is hoped to update the bibliography at regular intervals by issuing supplements.

I have deliberately said very little about pollution for the very good reason that it is well documented elsewhere. A good general bibliography is that by D. S. Moulder and A. Varley, *Bibliography on marine and estuarine oil pollution*. Marine Biological Association of the United Kingdom (Plymouth), 1971. This is being kept up to date by an indexing and retrieval system maintained in the Association's library which contains probably the major collection on this subject in the UK. Another very useful source is K. Henderson *editor*, *Pollution: sources of information*, Library Association, 1972, being the proceedings of the joint Aslib Library Association Reference, Special and Information Section Section conference in 1971.

Sources of information

I now propose to deal more briefly with some of the main sources of information. These fall into four categories: central government, government agencies and research institutes; local government and development associations; societies and institutions; and educational establishments.

The main central government departments dealing with oil are the Department of Energy, the Department of Industry, the Scottish Development Department and the Scottish Economic Planning Department. I do not propose to say much about these departments as their functions will probably have been dealt with by Mr Lyddon. The *Civil Service yearbook* provides a key to all government departments and lists enquiry points through which specific questions can be channelled.

Many government institutes and agencies can provide valuable data essential as background to North Sea oil developments. The Institute of Geological Sciences are presently amassing a good deal of information on the offshore geology of Britain, particularly around the Scottish coast. The Meteorological Office has much unpublished offshore data in addition to the excellent *Monthly Weather Report* for onshore stations. Their climatic means are now being updated to 1970, and the Edinburgh Office has published some useful regional reports including the *Climate of the coastal region of the Moray Firth*, and the *Climate of Orkney* (numbers 62 and 71 in the Climatological Memoranda Series). Wave data can be obtained from the National Institute of Oceanography (now part of the Institute of Oceanographic Sciences) at Godalming, who have calculated the probable extreme wave conditions for British waters, while the Hydrographic Department of the Ministry of Defence at Taunton are responsible for admiralty charts and the well-known admiralty pilots. The eleventh edition of the *West coast of Scotland pilot* is expected to be available soon, and the *North Sea pilot* is undergoing revision also. Other government departments supplying basic data for onshore situations include General Register Office, Edinburgh, for population figures to supplement or update the published county census volumes, and the Department of Employment for figures of labour availability.

Local government sources are of paramount importance for data concerning developments at particular sites. Backed up by their development plans, county councils can give information on available sites, incentives, and supporting infrastructure, sometimes in published form such as Ross and Cromarty's *Development directory*. Addresses and other details of all local authorities can be found in the *Municipal Yearbook*. Development agencies have also been active in obtaining and publishing material on offshore oil. The Scottish Council (Development and Industry) and the North East Development Council are particularly notable. The latter's *Oilfield: a directory of industrial resources in the North East of England*, 3rd ed., 1974, is a mine of relevant information.

The main societies and institutions concerned with technical aspects of offshore oil are the Institute of Petroleum, the Institute of Marine Engineers, the Society for Underwater Technology and the Underwater Engineering Group of the Construction Industry Research and Information Association. Details of all these bodies and many others including relevant university and polytechnic departments can be found in the useful *Guide to information services in marine technology* compiled by Martran Limited and published by the Institute of Offshore Engineering at Heriot Watt University. The Institute itself, set up in 1972 to help with the research and development problems of the offshore engineering industry, is also a handy source of specialized knowledge.

My own experience

It is partly because of oil that the Board became a member of Aslib. In the early years (1972 and 1973) there was so little available information on how much oil there would be in the North Sea, and how much and where the effect would be felt on the Highlands, and what would be the impact of a completely different higher standard of living suddenly imposed on parts of the area.

To help us answer some of these questions we asked Aslib to do a literature search and provide us with details of any post-1960 studies or information on the social, economic and environmental effects of oil production (particularly offshore production) and servicing on hitherto rural communities in developed countries. The result was rather disappointing and even a follow-up search of *Dissertation Abstracts International* produced only two references, one of which we subsequently obtained. The conclusion to be drawn (and I shall be interested to know if Brian Clarke's work bears this out) is that there had been very little interest in doing impact studies until about the late nineteen-sixties when the Invergordon projects already mentioned were started.

At a later stage, when the Drumbuie Enquiry was starting, we requested another literature search, this time widening the scope to post-war studies on the social impact of relatively large-scale industry introduced into sparsely populated areas in developing countries. This time we received a good many references concerning Ireland, the United States, Switzerland, France and Britain. We followed up many of these, but though of some interest they only served to reinforce the view of how unique the Highlands and Islands are in their social and cultural conditions. Perhaps the nearest previous approximations to the developments currently under way were the construction schemes of the Hydro Board during the fifties, but I have so far failed to locate any impact studies on the effects of their construction gangs on the areas concerned, and I would be interested to hear of any that do exist.

At about the same time I decided to compile a list of all recent and ongoing impact studies I could find that might be of possible relevance to our situation. This list was compiled in November 1973 and has been updated twice since then, the original data being held on cards. As Brenda White's experimental information service had been one of the sources approached, a copy was sent to her and subsequently publicized, a move which resulted in requests for copies from as far away as Birmingham and Bristol. The list is entitled *Scottish offshore oil: economic and social impact studies and ongoing research*. It was compiled from a large number of sources, including newspaper announcements of research grants, published research registers such as *Scientific research in British universities and colleges* and the *Index of current maritime research*, and from personal contact with many consultants and research workers who came to the Board, or contacted us in other ways. The contents of the list include many of the impact studies I have already mentioned together with the big ongoing studies by Professor Gaskin (mentioned above), by Brian Clarke, and the comprehensive Northern (Maritime) Offshore Resources Study being carried out jointly by Heriot Watt and Edinburgh Universities.

I have suggested that comprehensive studies, as we now know them, did not really start in this country until the late 1960s, yet, perhaps partly due to the expansion of higher education in the sixties, there are now perhaps too many being done, particularly what we might term proto-impact studies at undergraduate level. Communities, in the Shetland Islands in particular, have been subjected to large numbers of studies and surveys in recent years and saturation point may well soon be reached. There seemed to be a need for a register of recent and ongoing research on the north and so Professor Carter of Aberdeen and myself have collaborated to edit the first edition of the *North of Scotland register of research in the social sciences* which has just been published. While not yet fully comprehensive, one hundred studies have been listed and many of them have a bearing on the oil situation within the area covered, namely the Grampian and Highland regions and the island authorities.

Conclusion

I must now attempt to draw the strands of my paper together into a conclusion. It can be said that the offshore oil industry affects all of Britain from Cornwall to North West England to the Highlands and Islands. I have seen reports from Cornwall and industrial promotion material from North West England to bear this out.

There are plenty of information sources to be tried and a multitude of reports available, some more so than others. I have tried to mention most of the more important literature or to suggest guides in which relevant material may be listed. The *British National Bibliography* and the microfiche service *Books in English*, for books, and the current awareness services of the British Library Lending Division and the Technology Reports Centre, for reports and conference proceedings, together with the periodical abstracting and indexing tools mentioned, provide a good degree of bibliographical control.

The supply of such material from BLLD and TRC is well organized and usually reasonably rapid, and the wealth of other libraries, including those of the oil companies, is well documented in sources such as the Library Resources series of the Library Association, and in the *Aslib directory*. A subject guide to library resources in marine sciences is also being produced by the Marine Librarians' Association.

There is no lack of libraries and librarians covering the offshore oil industry to give advice, but it seems appropriate here to list a few basic acquisitions for anyone starting up such a collection. For the basic stock, I would suggest, a North Sea oil directory, the RSGS's *Scotland and oil*, the Institute of Offshore Engineering's guide to sources of information and the ANSLICS bibliography from which to select additions to the stock. To monitor the developing situation I would also include a weekly oil digest, in addition to the daily papers, and an abstracting or indexing tool, appropriate to the slant of the collection, and preferably with as little time lag as possible in publication.

It may be that the time scale or degree of difficulty of some information queries concerning offshore oil favour personal contact rather than written sources to provide the appropriate 'slick answers', but there is no lack of written material, and if the key to any good library collection is exploitation, the more efficiently the collection is organized, and therefore exploitable, the more 'slick' can be the answers.

BRIEF REVIEWS

BEELER, M. G. F. *and others*, Measuring the quality of library service: a handbook. New Jersey, Scarecrow, 1974. 208 pp. $6.50. (ISBN 0 8108 0732 7)

It is not uncommon to hear librarians and information officers complain about the indexing and retrieval problems caused by authors who use 'catch' or misleading titles. This being the case, it seems doubly curious that members of the profession should have produced a work with a misleading title.

Practitioners, urged to self-justification by management, would all love to be able to measure the quality of their library service. This book, laying claim by subtitle to the status of 'handbook', may be seized by such practitioners, in the hope of obtaining a manual which will tell them definitively and authoritatively how to measure their service. They are due for disappointment.

The book will only tell them how various people in the past have tried to measure various aspects of library service—in varying circumstances and with varying degrees of skill and success in the end-product. In fact the work is a collection of articles describing the methodology of various use and user studies. As such, it may interest the small population of library/information researchers. The practitioner, however, who may lack background knowledge to critically evaluate some of the techniques described, may actually be lead into malpractice. To give a concrete example: the brief and apparently irrelevant use of the projective technique with a highly structured questionnaire, cited on p. 113. Use of a projective picture in the context described seems a pointless bit of gimmickry, and could possibly even alienate the respondent.

As a final minor quibble, the book seems difficult to find one's way around. Better layout, and more liberal use of white space between articles would have helped.

MARGARET SLATER
Aslib R & D Department

LOMBARDI, MARY. Brazilian serial documents: a selective and annotated guide. Bloomington and London, Indiana University Press, 1974. 445 pp. £7.50 (ISBN 0 253 31262 0)

The result of research arranged by the Foreign Area Fellowship Program during 1971 and 1972, centred mainly in Rio de Janeiro and Brasília, and with fully acknowledged support from the world-famous IBBD (Instituto Brasileiro de Bibliografia e Documentação). Those of us in the UK who have been active upon Union Lists by subject rather than by country will be glad to see Miss Lombardi's recognition of advice received from Robert Collison and Douglas Foskett, among other experienced practitioners.

This *Guide* lists serials published mainly by official institutions, divided into 4 main parts: Federal Republic, Legislature, Executive, Judiciary. Of these, the third-mentioned has 18 subsections, and among these some autonomous agencies are listed, notably the IBGE (Inst. Bras. de Geografia e Estatística), the Instituto Rio Branco, Inst. Oswaldo Cruz, and several in the fields of health and welfare, and transportation. Useful notes on their origins and resources introduce each institution, within which their publications are listed in alphabetical order of title, totalling 1367 entries in the complete work. Details of content and frequency are given for every item. This is rounded off by a 3-page list of Contributing Institutions in Brazil and U.S.A.; 7 pages listing Works Consulted; and an Index of 78 pages showing serial titles by item-number, interspersed with Government agency names by page-number.

As will be seen, this is a guide to mainly governmental or para-governmental productions; this fact does not unduly detract from the value of the list, since Brazil is in the nature of things a country where a serial cannot easily be kept at a high standard of quality or continuity unless it has strong budgetary support. Holdings other than those of the publisher itself are not indicated, but the two cities mentioned in the first paragraph should hold all the material between them, and the compiler also mentions visiting São Paulo, Belém and Salvador. From the point of view of the practical researcher, there is a very adequate coverage of subject information for one country, even so large a one as Brazil. Within the scope she set herself, which includes discontinued titles, Miss Lombardi has made a successful and informative survey.

G. H. GREEN
Librarian, Hispanic and Luso-Brazilian Council, London

WEINER, M. Answering any questions: how to set up an information office. London, David & Charles, 1974. 120 pp. £2.95. (ISBN 0 7153 6478 2)

This book, which was published last year, is an extremely useful and informative publication for anyone with responsibility for providing an information service or, as the title says, setting up an information office. The author worked in Selfridge's Bureau of Information for some time and later founded and ran the Daily Telegraph Information Bureau. Although written from the point of view of her own experience in organizing and tracing information on almost every subject the sound advice and practical details she gives are relevant to all information services. Among the many aspects discussed are equipment; the merits of various filing systems; basic stock; how to deal with enquirers and a particularly good section on staffing. The book is very easy to read and recommended reading.

ASLIB LIBRARY

Does Your Research Association Suffer From Information Constipation?

THOSE AT RISK

R.A.'s who
Index more than 5,000 documents a year
and Are required to provide a comprehensive Information Service to their Members

THE SYMPTOMS

* Lengthy turn-around time in answering Members' queries
* Poor utilization of the Information Department facilities by research staff
* Inadequate Precision and Recall in retrospective searches
* Printed Subject Indices, SDI Lists, Current Awareness Lists, etc usually produced late

THE CURE

CAIRS is a minicomputer-based Relational Indexing System designed to meet the needs of most Information Departments. Because it resides "in-house", security of confidential information is under the control of the Research Association.
CAIRS permits the user to conduct fast interactive searches on a variety of keys (eg Author, Subject, etc) and—because it is an on-line system—allows the user to modify his search strategy in real-time to suit his particular requirements. In addition, the system can automatically generate various lists *in a state ready for immediate printing.*

THE COST

CAIRS is not cheap—although it's a lot cheaper than you think. So why not write to the address below for more details and do your own Price/Performance analysis. We think you'll be pleasantly surprised.

The Technical Sales Manager, Libra Information Systems Limited,
Chaudhuri House, Addington Street, Margate, Kent CT9 1PW.

British Technology Index

CURRENT SUBJECT GUIDE TO BRITISH TECHNICAL JOURNALS

FOR TRACING AND RECALL

of $\left\{\begin{matrix}\text{specific}\\ \text{recent}\end{matrix}\right\}$ information

in the Field of Applied Science, Engineering and Manufacturing Technology

Monthly Parts and Annual Volume

THE LIBRARY ASSOCIATION

7 Ridgmount St. Store St. London, WC1 7AE

(Phone: 01-636 7543)

Will the real ISI® please stand up?

If you're a librarian in a scientific or technical library, chances are you've heard of the Institute for Scientific Information. But the chances are equally good that what you've heard isn't the complete story.

For instance. Do you know how long ISI has been around? How many people we employ? How our services are produced? What disciplines we cover? What kind of training we offer to people who use our services?

To fill you in, we've produced an all-new, color-sound film—**Putting Scientific Information To Work.** It takes an inside look at ISI from our origin and development to what's happening now.

Putting Scientific Information To Work can be shown to your library staff for its clear picture of the scientific information explosion and how ISI's data bank and retrieval systems have turned scientific information into a valuable resource instead of a problem. Or show it to the research staff of your organization—especially if you subscribe to any ISI services. It's a good way to familiarize researchers with some of the services your library offers. Or if you're not a subscriber to an ISI service—but would like to be—the film can help you build researcher support for future acquisitions.

We think **Putting Scientific Information To Work** is a bright and informative introduction to ISI. It combines live action with an animation sequence so fine that it took third prize among 200 entries at the 2nd International Animation Film Festival in New York.

If you'd like to borrow this new 22-minute film, without obligation, simply fill in the coupon and return it to us. Or maybe you'd prefer to make the film part of an ISI information seminar. Then check the square at the bottom of the coupon; one of our information specialists will be in touch.

NAME____

TITLE____

ORGANIZATION________________________ PHONE____________

ADDRESS______________________________________

CITY________________ STATE______________ ZIP__________

DATE FILM DESIRED________________ ALTERNATE DATE____________

13-405

☐ I WOULD LIKE TO DISCUSS AN INFORMATION SEMINAR WITH YOU

ISI® **Institute for Scientific Information**
325 Chestnut Street, Philadelphia, Pa. 19106, U.S.A., Tel: (215) 923-3300, Cable: SCINFO, Telex: 84-5305

©1974 ISI

OFFSHORE ABSTRACTS

This new publication covers world literature relating to processes, research, and new developments in every area likely to be of interest to those engaged in, or manufacturing for, the **OFFSHORE OIL and GAS INDUSTRY.**

All major information sources are covered, including current world literature from many thousands of journals.

Abstracts with full references of technical articles, conference papers, research reports, trade literature, standards, and patents are presented in an informative style, and sectionalized for easy reference.

Six issues a year are published, plus an annual, detailed subject and author index for retrospective searching.

Subscription
UK subscribers £30. Outside UK $80.

OFFSHORE
INFORMATION
LITERATURE

30 BAKER STREET,
LONDON, W1M 2DS

Published in England by Aslib, 3 Belgrave Square, London SW1X 8PL
Printed at the Alden Press, Oxford

1975 AUG 7

Aslib

Proceeding

A COMPREHENSIVE ON-LINE COMPUTER SYSTEM FOR SPECIAL LIBRARIES

BLIPS: the Building Research Establishment library processing system *H. H. Neville and P. J. Elvin*

Computer aspects of the BLIPS system *L. S. Vallance*

Extended use of the BLIPS system *P. J. Elvin and H. H. Neville*

Patterns of information flow during the innovation process *R. Rothwell*

British Standards Institution publications *A. M. Allott*

CALCUTTA UNIVERSITY
CENTRAL LIBRARY.

May 1975
VOL. 27, NO. 5

ISMEC

THE QUALITY INFORMATION SERVICE IN MECHANICAL ENGINEERING

The new **ISMEC Information Service in Mechanical Engineering** uses the man-machine comination to achieve the highest standards of quality. Consider some of its features.

Biweekly issues of **ISMEC Bulletin** cover the periodical, conference, book .... literature in mechanical engineering. In each issue, titles are organized within a detailed classification scheme. Cross references are used liberally and where a title does not clearly indicate the subject matter of the reference, it is enhanced by additional words or phrases. Each issue has an Author Index and a Subject Locator which reinforces the classification scheme. Semi-Annual Indexes provide separate sequences for Authors, - Bibliographies - Books - Conferences - Reports - Subjects and a List of Journals. The Authors' sequence includes the author's article title(s) and the Subjects' sequence organizes unique phrases for each reference under a fixed thesaurus.

Features such as these and many others direct users efficiently and quickly to their precise area of interest.

Why not ask for a sample copy and judge for yourself.

Orders and Inquiries

U.S.A., Canada, Americas

ISMEC Marketing, Attn. D Gieb
The Institute of Electrical & Electronic Engineers Inc.,
445 Hoes Lane,
Piscataway,
N.J. 08854,
U.S.A.

Rest of World

ISMEC Marketing
Woodside House,
Hinksey Hill,
OXFORD, OX1 5BP,
England

ISMEC

ISMEC—Published jointly by the Institution of Mechanical Engineers and INSPEC
(The Information Services Division of the Institution of Electrical Engineers)

Aslib Proceedings

VOLUME 27 MAY 1975 NUMBER 5

© 1975 Aslib and contributors

Aslib Proceedings *is published monthly and supplied free to members of Aslib. Subscription rates are £18.00 annually to non-members, or £9.00 to Aslib members requiring additional copies. Single copies £1.70, or 85p to members.*

Further information about Aslib's services and membership rates will be supplied on application to the Director, Aslib, 3 Belgrave Square, London SW1X 8PL. Tel: 01-235 5050. Telex 23667; answer-back, Aslib London.

Notes for contributors

Aslib Proceedings now accepts contributed papers in addition to those presented at Aslib meetings and conferences. They should be of a practical nature and of some relevance to problems encountered in the everyday operation of library and information units, or services. Other kinds of contribution which will be considered for inclusion are short notes on new information units or special libraries; the introduction of new techniques or systems in existing libraries where these may be of general interest; equipment designed by members for special purposes and put into operation in their own organizations; and objective reports on experience with new 'packaged' commercially available information services.

Contributions, which should be typewritten, double spaced, single-sided on A4 paper, and not more than 3,000 words in length, should be addressed to the Editor, *Aslib Proceedings*, 3 Belgrave Square, London SW1X 8PL. If possible, authors should include a summary of up to 200 words with the typescript. Authors will receive twenty-five offprints of their article free of charge.

A comprehensive on-line computer system for special libraries

Proceedings of a symposium held at the Building Research Establishment, Garston, in December 1974*

Chairman: Mr. R. E. Jeanes

Assistant Director, BRE

IN HIS INTRODUCTION the Chairman said that the intention of the symposium was to discuss informally a proposal for a new library system. BLIPS (BRE Library Processing System) was not an existing package but a proposal arising out of the development of the BRE Library. Since the cost of bringing the system into being was likely to be large, and the eventual package would be applicable to a range of special libraries, it had seemed sensible to invite possibly interested specialists to discuss it at an early stage. One aim of the symposium was therefore to expose the proposal to people with experience in the field so that BRE might gain from their comment. Given that the system was not specific to a particular library, but rather to a type of library, it had seemed that the right way to proceed was along co-operative lines. The proposal represented a large development, and research into library methods was not the Establishment's *raison d'être*. The second aim of the symposium was therefore to gauge the possibilities for co-operative development, if after discussion the ideas seemed worth pursuing further. Such exploration would involve several steps, such as feasibility study, systems study, and so on, before reaching detailed programming. It would not be reasonable to try to develop the system for every kind of library—the computer world was full of unsuccessful cosmic schemes—hence it was felt at present that co-operative development might be limited to some practical sub-set of special libraries.

---

* This Symposium was held on 18th December and repeated on 19th December because of the amount of interest shown in the Subject. The discussion sessions from both days have been combined.

Aslib Proceedings 27 (5), May 1975, pp. 188. Printed in Great Britain

BLIPS: The Building Research Establishment Library Processing System

H. H. Neville and P. J. Elvin

BRE

Paper presented at the BRE Symposium on A comprehensive on-line computer system for special libraries, Garston, December 1974

Abstract

Proposals are presented for specifying a computer system for storing and searching library records in a single library or a group of associated libraries. The system provides for on-line searching at each library and off-line production of accessions lists, abstracts bulletins and bibliographies, as well as SDI service. The use of skilled effort is shifted from the input operation to the searching stage by the use of selected natural language keys, but searching for known items is made easier than in more traditional methods by extending the use of post-coordination to catalogue data.

Essential library functions

I SHOULD LIKE to begin by defining the essential data-processing operations that a special library needs to carry out, and to define them in a way which does not imply any particular method of carrying them out. The familiar operations of cataloguing, subject indexing, and classifying have been developed over a long time for human operators applying various intellectual and intuitive skills. If we think in terms of 'computerizing' these operations we shall be taking advantage of the computer only to the extent of using it to take over certain sorting and printing functions, whilst the skilled human contribution is left virtually unchanged. If computers had been available before traditional cataloguing, would we now have MARC?

There are five essential data-processing functions which need to be considered:

(1) The library collects primary information embodied in documents of various kinds and secondary information in the form of bibliographic references, with or without abstracts, relating to documents which it may not possess but can obtain from elsewhere when required, or to parts of composite documents which it does not possess as separate entities, *e.g.* articles in periodicals. All this information, primary and secondary, is stored in a systematic way so that each item has a definite location on a shelf or in a filing cabinet, indicated by some sort of alphanumeric code. Various kinds of code are used, according to the type of document, *e.g.* UDC numbers, accession numbers, and these are meaningful to anyone who is familiar with the library.

(2) The library must be able to produce required items in response to users' requests. These requests are essentially of two kinds: those which ask for a

Aslib Proceedings 27 (5), May 1975, pp. 189–203. Printed in Great Britain

known item, *i.e.* a specific document which the user can describe more or less adequately by quoting certain features such as author, date of publication, title, etc., and those which ask for information about some subject and do not name any particular document. In this case the concepts or words with which the user describes the subject are the features of the information that will have to be used to find what is wanted. I use the word 'feature' in its information retrieval sense, and I have just distinguished between what Jolley[1] calls 'object features' and 'subject features'. I am not sure that we need to make this distinction, but more of that later.

(3) Libraries do not generally act solely in response to requests. They seek to bring possibly useful information to the users' attention by issuing periodical accession lists, abstract bulletins, bibliographies, SDI service and the like. These services may be regarded as derived from the library's records of primary and secondary information by reproducing in a suitable format selected records chosen according to certain criteria. Thus accession lists present records of primary items or documents acquired during a recent period, an abstract bulletin reproduces secondary records collected during a period, bibliographies reproduce records selected by subject, by author, or by some other criterion, and SDI service is the same sort of thing tailored for individual users.

(4) Regularly published abstract journals and bibliographies may need to be provided with printed author and subject indexes at intervals.

(5) Libraries lend books and therefore need to be able to find out whether a particular item is on loan, and if so, to whom, and since when.

Use of skilled effort

These are the main data-processing operations that BLIPS is designed to carry out. Traditionally all except the last require some degree of intellectual skill both in making the record and in searching. The tendency in the development of conventional systems has been to try to achieve improved retrieval by making the systems more elaborate or more subtle, and to analyse the input items more carefully in order to take account of all their complexities. We thus find ourselves using a great deal of scarce human skill in preparing the input to our conventional systems and comparatively little in relatively infrequent searching, and the computer can only be used for manipulation of the records whose preparation has required so much skill. It would seem more sensible in such circumstances to simplify the input process and shift some of the skilled effort to the search or output operation.

There are computer systems which virtually eliminate the need for human skill at input, such as KWIC indexing and its variants, citation indexing, which depends on a totally different approach, and various proposals for automatic indexing[2] or free text analysis. The first two are well established, while automatic indexing is still in a rather tentative state. All these methods have been directed primarily to information retrieval or subject indexing and little attention has been given in this respect to the total problem of document and information retrieval in a library context.*

* Some of the work of Kilgour,[3] however, is relevant to the problem of circumventing the need for human skill in processing catalogue data.

Document 'features'

Returning to the idea that what our recording systems are essentially concerned with is to record for each item of information a set of 'features' which collectively characterize it, and that retrieval consists in matching the 'features' expressed or implied in the request with those in the records, we can say that the features conventionally used for cataloguing for document retrieval, which may be called 'object' features, are the extrinsic features which collectively characterize the document as a literary object, *e.g.* author, publisher, date of publication, whilst the features conventionally used in classifying, subject indexing, and information retrieval, which may be called 'subject' features, represent collectively what the information is about. The title of the document is a hybrid feature: it is an object feature clearly inscribed on the front of the document, but it also tells us what the document is about, although it often does this inadequately or obliquely.

Object features should be easy to handle because they are generally explicitly displayed on the surface of the object, but our conventional systems make them difficult. Take for example a document which has the following object data clearly displayed on its cover:

> Building Research Establishment Current Paper 54/74
> May 1974
> The effect of moisture content and wood preservation on the assembly gluing of timber
> R. A. Laidlaw, B. H. Paxton
> Princes Risborough Laboratory
> Department of the Environment

This looks quite straightforward, and the title is admirably informative, but there appear to be three organizations responsible for this document. Conventional cataloguing requires one to establish that the Princes Risborough Laboratory is part of the Building Research Establishment which is part of the British Department of the Environment, and to express this relationship in the form of the record. There is the further complication that if the catalogue contains earlier documents from the same source, one has to take account of the fact that the Laboratory was formerly called Forest Products Research Laboratory when it was part of the Department of Trade and Industry, formerly Ministry of Technology, formerly Department of Scientific and Industrial Research. Furthermore the earlier issues in the series of *Current Papers* were produced under the name of the Building Research *Station* which was attached to various Departments during the lifetime of this series. Of course in this library we know this particular set of complexities, but what a headache for cataloguers in other libraries!

Subject features

So object features will not stay simple unless we take steps to keep them so. Most of the difficulties arise from the fact that conventional catalogues are precoordinated records and no attempt seems to have been made to apply the now well-established principles of post-coordination in this area.

Subject features have always been recognized as difficult because they concern the 'aboutness' of the information and this involves conceptual difficulties as well as semantic and syntactic ones: this is what information retrieval, as ordinarily understood, is concerned with. Regarding the titles as hybrid features suggests how we may proceed. The actual significant words of a title are object features in so far as they are readily identified as a physical part of the document without any appreciable amount of human skill. If the title is a good one, these words can alone serve as subject features. If the title is not a good one we can, with minimal additional human skill, pick some further significant words from any subtitle, abstract, summary, introduction or from the main text. This makes the input operation very simple and practically devoid of human skill. As far as these object/subject features are concerned we shall defer any conceptual, semantic, or syntactic difficulties until we come to make a search, and, as indicated earlier, it seems preferable to concentrate the human skill at the output rather than at the input.

The use of natural language for information retrieval is of course not new, but most of the work in this area is experimental, and existing systems are generally not suitable for on-line searching. Current research is usually concerned with more than merely locating the presence of certain words in a text; it is generally concerned with the much more difficult problems of identifying semantic relations and syntactic structures. In BLIPS we are merely recording the presence of certain words in a document. Moreover, we are not concerned with continuous text: we retain the very small but significant amount of human skill required at input to select a few significant words from a title or abstract.

'BLIPS' records

The BLIPS system makes use of a simple type of input record for items of all kinds. The record has 11 fields, some of which are optional. Some fields are used for a more or less conventional description—authors, title, abstract, etc., but the content of these fields and the precise way in which the content is set out are of no consequence for retrieval since these fields are not used for searching, they merely determine the appearance of printed output.

A single field is provided for all the features used for post-coordinate searching. Features are represented by tags, a tag being defined as *any* string of up to 25 characters without spaces. Tags may be devised in any way desired but a simple rule is proposed for converting personal author names with initials into character strings.

Corporate author names are handled by treating each significant word as a tag. With titles too, all significant words may be entered as tags. Where the title is not adequate to indicate the subject, additional tags may be culled from the abstract or from the text of the document and inserted in the tag field. Any other document features that are regarded as useful for retrieval may be inserted as tags, *e.g.* publisher, country of origin, language, ISBN.

For serial items the series title can be tagged by its significant words, and the number entered as a simple tag. It may be convenient to use codes for some of these tags, *e.g.* UDC auxiliaries for countries.

The input record has the following fields:

1 * Item number
2 * Confidential status
3 * Location
4 * Brief description
5 Full bibliographic description
    a Personal authors
    b Specific title
    c Corporate authors
    d Series title and number
    e Publication data
6 Abstract
7 Library comments
8 * Tags
9 KWIC title
10 Sorting code for publications
11 * Loan data

Record processing

The input is intended to be made from a VDU terminal to a daily update file, which is incorporated in the main files overnight. The program will assist the input operator by displaying the record structure and by carrying out certain validation routines.

Even though most records will have several blank fields, the quantity of information is too great for all of it to be handled on any on-line system likely to be available. Two main files are therefore provided: a full records file on magnetic tape and a brief records file on disc for on-line working. The latter contains the starred fields. An on-line search at a terminal will result in fields 1–4 being displayed for all relevant items. The loan data, field 11, for any one of these items can be called up also, and amended. The full records are obtainable in two ways:

(a) Having obtained a sight of brief records at the terminal and decided that full records are required, the searcher may give an instruction which causes the relevant item numbers to be stored and run with the magnetic tape file overnight to give a print-out of full records the following day. This will be appropriate when a large number of hits has been obtained.

(b) A file of 'item cards' will be maintained, containing the full text of the records and filed in the item–number sequence. Having obtained a sight of the brief records at the terminal, the searcher may look up the item card file to see the full records of any of them. This will be appropriate where only a few hits are obtained and one does not want a printed output, for example in routine catalogue look-up, when one is looking for a single known item, several hits may be presented and the brief records may not always enable one to be certain which represents the required item.

Provision is made to provide printed item cards automatically from each night's updating run from the daily input file.

Input record fields

To consider the input record fields in more detail:

(1) The item number is a composite serial number identifying each record uniquely. It is designed to enable the data-base to be divided into several sections which can be searched separately or together. The first character indicates which of several associated libraries is responsible for the item, the second character indicates the type of item—accession, non-accession, dummy item (to be described later), or special collections of records which can be allocated as desired. The next two characters represent the last two digits of the year of publication, and the remaining 5 or 6 characters can be used in any way desired to form a numerical series within each section of the data-base.

(2) The confidential status field is either blank or contains a suitable word or phrase to indicate that the record relates to confidential information. The program contains a built-in bar to the selection of confidential items for any output and these items can be obtained only if a special password is included in the search profile.

(3) The location may be any alphanumeric code used to indicate the shelf location of a document. It may be blank for non-accession items.

(4) The brief description is limited to one line of VDU display—about 80 characters. This may contain whatever the input operator considers suitable to describe the item, for example, author and short title. It is not reproduced in any printout and plays no part in retrieval. It need therefore not be formalized in any way and can be composed on an *ad hoc* basis. Its purpose is to give the on-line searcher some idea of the nature of the items he has retrieved.

(5) The full bibliographic description consists of five sub-fields and is not limited in length. This resembles a traditional catalogue entry, but since it plays no part in retrieval it needs to be formalized only to the extent necessary to give a reasonable appearance when printed out. The sub-fields are marked by punctuation marks which control the format of the printed output. Any of the sub-fields may be blank, but the punctuation marks remain.

(6) An abstract of up to 200 words may be inserted in field 6.

(7) The 'Library comments' field may contain any brief remarks that the library may wish to have on record for internal use. The field will appear only on item cards.

(8) Virtually any feature of an item may be tagged and thus used for retrieval, and the program will accept any character string as a tag. The following simple rules are proposed for the more obvious kinds of tag. Personal authors' names are tagged by running together the surname followed by forename initials, thus A. B. SMITH becomes SMITHAB. For corporate authors' names significant words are used as tags, thus ROYAL INSTITUTE OF BRITISH ARCHITECTS becomes ROYAL, INSTITUTE, BRITISH, ARCHITECTS—four tags. If the organization is part of a parent body, both can be tagged, thus PRINCES RISBOROUGH LABORATORY, BUILDING RESEARCH ESTABLISHMENT becomes six tags and can be retrieved by quoting any one or more of them.

Titles are tagged by using significant words occurring in them. This serves the double purpose of recording the title as a document feature and of indexing the subject. If the title is not adequate for the latter purpose, additional tag words are selected from the abstract or from the text of the item. The fact that the title is not treated as a single complete entity is no disadvantage If it were so treated, it could be retrieved only if it were quoted absolutely correctly, letter for letter. A request quoting a title can seldom be relied on to be so accurate, whereas if one merely has to pick one or more significant words, one stands a good chance of matching the record.

In the case of serial publications the series title is tagged by its significant words and the serial number is used as a tag on its own. Thus BRE DIGEST NO. 150 becomes DIGEST, 150. A few house rules are needed to achieve uniformity in the treatment of hyphenated words and complicated serial numbers. Any other features may be tagged as required, *e.g.* country of origin, language, ISBN. Codes may be used for some of these, such as UDC country and language auxiliaries.

Fields (9) and (10) are used for items destined to be printed out for publication in accessions lists, abstract bulletins and the like. It is assumed that the items will be grouped under some broad categories or numbered headings. The list of headings and numbers will be stored for insertion in the print-out, and the numbers are used as a sorting code. When an item is intended to be included in the next issue of a list, therefore, the appropriate category code is inserted in field 10. During the overnight processing of the daily update file the relevant fields from items having a code in field 10 will be extracted and stored on a holding file. Once a month, or whenever the next list is to be prepared, this holding file is subjected to a sort and print run which prints out the accumulated items in their categories, and inserts the necessary category headings. The fields to be printed can be selected.

If the publication is to be provided with indexes, in each issue or cumulated over several issues, these take the form of KWIC or KWOC 'subject' indexes and alphabetical author indexes. In such cases a KWIC title is inserted in field 9. This may be the actual title or an edited version of it, and the words to be used as keywords are starred. During the nightly update run the KWIC titles and the authors' names are copied onto a holding file in a form which can later be used as input to a software package which produces KWIC or KWOC listings. Authors and titles may be kept separate or mixed. When indexes are required it is necessary to number each printed item so that the index can refer to these numbers. This is achieved by adding a serial number to the sorting code.

Loan record

Field 11 contains loan information for accessioned items. Briefly the system provides for inserting in the record of any accessioned item a borrower's name, the date of loan, and a very brief comment (*e.g.* 'RECALLED' 'LOST'). Up to five copies of an item may have individual loan data and it is possible to indicate the existence of additional 'spare' copies. If an item is destined for loan immediately after being accessioned, the loan data are inserted in field 11 as part of the initial input record, otherwise merely the number of copies is indicated here.

When an on-line search is being made, brief records are displayed. At this point the loan data for any of these items can be called up and amended.

In addition two off-line loan record outputs are provided: a list of all items on loan to a particular borrower, and a list of all items to any borrowers on loan on or prior to a given date. A list of currently valid borrowers' names is stored and attempts to insert a borrower's name are validated against this list. Safeguards are provided to prevent unauthorized amendment of loan records and to prevent the insertion of a loan record against an item indicated as a reference copy.

Searching

Searches are intended to be made on-line from a VDU. A selection of tags is typed with appropriate logical operators. If a tag does not exist in the system an error message is displayed, otherwise the frequency of use of the tag will be displayed. Other search criteria may be added, viz date range and section of data-base required (as determined by the first part of the item number), and password for confidential items.

The first response will be a statement of the number of hits. The searcher may then wish to amend the profile. If not, he may ask for brief records to be displayed. He may then wish to alter the profile further (it is kept on display), or he may wish to call up the loan record for any single item and possibly amend it, or he may ask for full records to be printed out overnight.

The main question that will be asked is whether one can carry out information retrieval effectively with uncontrolled tags or keywords. The process is certainly likely to take longer than searching with a controlled language, and the search profile is likely to be more complex. For example, if we wish to find information on domestic electric heating, the existing BRE thesaurus-based system[4] will quickly reveal that the two keywords HOUSES and ELECTRIC HEATING should be used. In the BLIPS system we should have to consider what words could have been used to write about this topic and we might think of DOMESTIC, HOUSE, DWELLING, HOME, ELECTRIC, ELECTRICAL, ELECTRICALLY, ELECTRICITY, HOUSES, DWELLINGS, HOMES, HEATING, HEATER, HEATERS and some more. The search profile then becomes a complex mixture of ANDS and ORS. Most of the alternatives are grammatical variations affecting the ends of the words, and a fragment searching facility will enable us to reduce the profile to

DOMESTIC
OR HOUSE—
OR HOME—
OR DWELLING—
AND ELECTRIC—
AND HEAT—

This would probably be good enough for a start and we could examine the brief records retrieved. These may suggest other words that might be added to extend the search, ('OR' additions) or to restrict it if we are getting too many unwanted items ('AND' or 'NOT' additions).

Provision is made for obtaining at any time, off-line, a print-out of all the tags currently on record and for editing the files to delete tags and to merge existing tags so that they are treated as synonyms. Periodical editing will allow tags to be removed if on reflection they are considered to be superflous, and the synonym facility will enable certain variant spellings to be dealt with. There are probably few words in the language which are really synonymous in all contexts, but the synonym facility should be useful in certain cases.

The removal of skilled effort from the input operation carries some penalty in increased skill applied to the retrieval of information on subjects, and this is regarded as economically advantageous on balance, as stated at the outset. When we consider searches for known items, however, there are positive advantages in the system, in addition to simplification of the input. These come from the application of post-coordination to the bibliographic features, from the possibility of recording a great variety of features, and from the ability to search word fragments.

This arises because a conventional card catalogue is a pre-coordinate system in which many document features may be recorded, but only one, namely the author's name, is directly accessible. In BLIPS any or all of the features tagged can be used in a search simultaneously and in any sequence or combination. For example, if we are seeking the BRE *Current Paper* quoted earlier, and all we are told about it is an enquirer's vague recollection that there was a paper on wood gluing by someone called Pacton or Paxton, initials unknown, published within the last couple of years or so, it is likely that the use of the profile

```
     WOOD
OR   TIMBER
AND  GLU—
AND  PA—TON—
     DATE RANGE 72–74
```

would identify the item absolutely. (The addition of 'OR TIMBER' represents an intuitive step by the searcher, but the degree of intuitive skill is not very remarkable.) Of course we can imagine that the search would reveal that some organization in PAignTON has published reports on a GLUt of TIMBER bungalows in the housing market. If there are only a few such items they will not prevent us from picking out the paper by PAXTON from the brief records displayed. If there are many such interfering items we would add

```
NOT  BUNGALOW—
NOT  HOUSE—
```

to the profile to eliminate them.

A category of 'dummy items' is provided to enable certain on-line queries to be dealt with. For example, one may wish to include cross-references like

(a) RIBA—SEE ROYAL INSTITUTE OF BRITISH ARCHITECTS
(b) PRINCES RISBOROUGH LABORATORY—FOR PUBLICATIONS PRIOR TO 1972 SEE FOREST PRODUCTS RESEARCH LABORATORY

(c) MAPS—NOT INCLUDED IN SYSTEM, SEE SEPARATE MANUAL CATALOGUE

Records of this sort, intended only for display at terminals, can be included as dummies with appropriate tags, and will be displayed in response to the tags used. Thus the acronym RIBA, inserted as a tag, will cause its full interpretation to be displayed. Dummy items are identified by a special character in the item number prefix which prevents them being selected for any printed output.

FIG. 1: *Printed record format. The marginal numbers indicate the fields. The record shows an imaginary document with all fields in use, and is atypically complex.*

(1), (2) (3)	A074 12345 CONFIDENTIAL 620.193 (087.23)
(4) (11)	IAK SB24: JOACHIM & WEISS: CORROSION OF 'PRIMASTAHL X5' [3]
(11)	[1] REF [2] SMITH AB 24.10.74 RECALL [3]
(10)	B31/104
(5a)	JOACHIM, K. B. WEISS, J. P.
(5b)	<KORROSIONSVERHALTEN VON 'PRIMASTAHL X5' GEGEN SAUREN/CORROSION BEHAVIOUR OF 'PRIMASTAHL X5' IN ACIDS>
(5c)	INTERNATIONALER AUSSCHUSS FUR KORROSIONSTECHNIK;
(5c) (5d) (5e)	GRUPPE MESSEN UND PRUFEN; SONDERBERICHT SB24 = THE COMMITTEE, WIESBADEN, 1974, 45 PP =
(6)	ABSTRACT OF ABOUT .... 200 words
(7)	EXCHANGE, RECD 10.5.74
(8)	JOACHIMKB, WEISSJP, INTERNATIONALER, AUSSCHUSS KORROSIONSTECHNIK, GRUPPE, MESSEN, PRUFEN, SONDERBERICHT, SB 24, CORROSION, PRIMASTAHL, X5, ACIDS, MEASUREMENT, RATE, INHIBITION, PITTING, (430.1), COMMITTEE, EXCHANGE, K45C
(9)	*CORROSION BEHAVIOUR OF *'PRIMASTAHL X5' *STEEL IN*ACIDS

Notes (numbers refer to fields)

(1) Composite item number indicating source library A, item type 0, year of publication 74, serial number 12345.

(3) A UDC number is used for location in this instance.

(4) The brief description gives in this instance the initials of the corporate author (presumed to be familiar to users), series and number, authors, short title.

(11) 3 at the end of the brief description indicates the number of copies, the next two lines show that copy 1 is for reference, copy 2 is on loan and is being recalled, copy 3 is available.

(10) This is to be 104th item in section B3 of an abstract bulletin.

(8) The tags up to 'acids' are copied from earlier fields, 'measurement' to 'pitting' are additional tags taken from the abstract (not shown); '(430.1)' is the UDC number for the country of origin. The tags 'committee', 'exchange' are added because the library is imagined to wish to tag certain committee papers and exchange publications, and 'K45C' represents some imaginary code that the library wishes to use.

(9) KWIC or KWOC title for index to abstracts, with keywords starred.

Summary of the BLIPS structure

Figure 1 shows a specimen complete input record. Various outputs are produced by selecting certain fields. Thus item cards will contain fields 1, 2, 3, 5, 6, 7, 8;

the brief record displayed on a VDU in response to an on-line enquiry will shows fields 1, 2, 3, 4 and field 11 if the loan record is called up; a print-out of full records for enquiry work and SDI will reproduce fields 1, 2, 3, 5, 6; abstract bulletins, accessions lists, and bibliographies will reproduce fields 10, 5, 6, and optionally 1 and 2. The fields 5a, 9, and 10 are stored for later use in printed indexes to abstract bulletins, produced off-line. Finally, Figure 2 lists the various inputs and outputs.

FIG. 2: *Summary of inputs and outputs*

INPUTS
(1) On-line from the VDU terminal to daily update file
    New and amended records
    New and amended borrower's names
    Requests for off-line outputs (3) below
(2) On-line from VDU terminal to disc files
    Search profiles for on-line enquiries
    Requests for off-line print out of full records
    Loan record amendments
OUTPUTS
(1) On-line to VDU terminals
    Brief records displayed in response to on-line enquiries
    Loan records displayed for specific items
(2) Off-line, produced nightly
    Full records for on-line requests
    Errors in input to daily update file
    Item cards for new records accepted
(3) Off-line, produced when required
    Printer's copy for accession list, abstracts bulletin and other publications
    Author and KWIC or KWOC indexes for publications
    SDI services
    List of all tags in the system for editing and amendment of tag file
    List of all borrowers' names
    List of all items borrowed by a named borrower, giving brief records and date of issue of each item
    List of all items borrowed by any borrowers on or prior to given date, showing brief records, and borrowers' names

In conclusion, I should like to draw attention to a problem of information retrieval that must be familiar to anyone who has worked in this field for a number of years, although I have never come across any discussion of it. All retrieval systems which involve fitting the information into a pre-determined conceptual or linguistic structure have a limited life because either the progress of knowledge makes the structure out of date or the interests of the library change beyond the scope of the structure adopted. Structures, such as thesauri and classification systems, can be revised, but the time comes when a new one is needed. In this library for instance, our present information retrieval system is the fourth in 50 years, and the useful life of successive systems has become progressively shorter.

At each change of system, one has to choose between re-indexing the earlier material or putting up with having separate closed systems. The labour of re-indexing is generally too great to be undertaken. Since BLIPS uses only object features, without reference to any structural view of the subject or of the language, its records are permanently valid representations of the indexed documents. One may perhaps seek to improve its effectiveness by imposing some system of linguistic or conceptual analysis or control on the formulation of search profiles, and such a system could be changed from time to time, but none of this would require any re-processing of the original records.

REFERENCES

1 JOLLEY, J. L. *Ideas* (published in-house by Goldsmith's College, University of London) (29), 1974, pp. 154–61.

2 *e.g.* SPARK JONES, K. 'Automatic indexing 1974–a state of the art review,' University of Cambridge, Computer Laboratory, April 1974.

3 KILGOUR, F. G. *et al. Proceedings of the American Society for Information Science*, 7, 1970, pp. 79–82; *Journal of Library Automation*, 4 (4), 1971, pp. 207–10.

4 PRANGNELL, R. D. *and* ELVIN, P. J. 'Information retrieval by computer at the Building Research Establishment Library,' *Information Scientist*, 9 (1), 1975, pp. 3–17.

DISCUSSION

MR B. D. RODEN (BSI) asked about the size of the BRE data base and the frequency of loans.

DR NEVILLE replied that the rate of input of new items would be about 12,000 p.a. contributed by three libraries. About 40 per cent of these would be loanable accessions. Since the loan record was potentially available on the disc file for each accession the actual number of loans would not materially affect the size of the file.

MR R. H. SEARLE (Transport and Road Research Laboratory) was concerned about the inconvenience to the would-be borrower of a known item when, as in most library systems, he had first to find the required item record and then look it up in a separate record. It would be better to include the loan information on the VDU display at the first step.

DR NEVILLE replied that the two records were virtually integrated. Having set up a search and obtained a display of brief records (and for a known item record one would expect to have only a few hits), the loan record for any one of these could be called up immediately by pressing a button. This loan record could then be amended, if required, immediately.

MR J. TROAKE (Property Services Agency) asked if the use of UDC in place of keywords had been considered.

DR NEVILLE replied that at BRE the UDC was used solely as a location system for books. For detailed information retrieval keywords had been used for the last 12 years.

THE CHAIRMAN intervened to ask whether nevertheless UDC numbers could be used as tags.

DR NEVILLE said that this was so, and moreover complex UDC numbers could be broken down into their components and thus used post-coordinately.

MR B. J. DRISCOLL (British Broadcasting Corporation) asked whether the tags would be selected by human indexers or automatically.

DR NEVILLE said that some degree of automation had been considered to ease the task of the input operator. Practically all the tags would have been typed in the earlier fields already. To avoid typing them again as tags one could perhaps run a cursor over the text on the screen and press a button each time a tag was reached. The personal authors needed to be slightly rearranged when inserted as tags, but this would probably be done automatically.

MR A. D. GILCHRIST (Aslib) asked whether there was any limit to the number of tags in field 8. If there was a limit, this would present the input operator with problems of selecting tags and of dealing with document partition.

DR NEVILLE replied that the number of tags was mainly a matter of the economics of computer storage and search time, but one would have to establish some 'house rules' for the average and maximum number of tags as a guide to the operator. Present calculations were based on an average of 20 tags per item and a maximum of 40. As to partitioning, it would be necessary to treat each part of the document as a separate record.

MR D. J. DANCY (UKAEA, Culham Laboratory) welcomed the idea of reducing the input effort, but was doubtful whether it was worth while to provide a loan system since the sort of library envisaged tended not to handle many loans. Many requests were satisfied by photocopies rather than loan.

MISS B. SANTS (BP Research Centre) raised a similar point on the second day.

DR NEVILLE agreed that the loan record facility was not an essential part of the system, but pointed out that even at the BRE level of 400 new loans per week the amount of clerical effort involved, and the low efficiency of manual handling, was troublesome.

MRS J. AITCHISON (Consultant) suggested that it would take about as long to input an item like the one shown (Fig. 1) as in manual cataloguing. Were there any figures for the input time in present BRE practice?

DR NEVILLE replied that no timing figures were available. The saving was one of time and skill. The BLIPS input would be done largely by non-professional staff.*

MRS AITCHISON was doubtful whether a KWIC index for publications was satisfactory.

DR NEVILLE agreed that it was inferior to a good manual subject index, but the saving in effort was so great that it was felt to be worth while.

MR J. BUSHNELL (Department of the Environment) wondered how the system would feel to the user. Would he no longer be able to browse among the shelves, and would the librarian's role be reduced to finding the document on the shelf when the user has decided what he wants? Would the BLIPS approach discourage users?

DR NEVILLE said browsing among the shelves would be unchanged. BLIPS would replace the card catalogue. Users were often put off by large card catalogues which are tiresome to use. In a research organization where users are increasingly using terminals in their own work they would be likely to accept the use of a terminal in the library. There was evidence for this in the use made of the present BRE on-line system. Some training would be needed to enable users to operate the terminals.

THE CHAIRMAN asked whether the library staff would continue to be available to search for readers or to help them make their searches.

DR NEVILLE confirmed that this would be so.

MR E. SMITH (Central Computer Agency) asked for some idea of the costs of (a) software development, (b) hardware, (c) running and maintenance, as compared with costs of present operations.

THE CHAIRMAN explained that when the system was first proposed it was clear that it would have to be looked at both from the point of view of cost and from that of benefit and acceptability to libraries. It so happened that the latter aspect was being looked at first. A cost and feasibility study would have to follow if the system were to be set up.

MR W. DIGGENS (Central Computer Agency) asked what proportion of items put into the present library system were never used, as a measure of the degree of skilled input effort wasted at present.

DR NEVILLE said that it was not practicable with a manual system to record the number of times an item was retrieved. However, this question suggested to him that a means of collecting such statistics might usefully be incorporated in BLIPS.

MR DIGGENS asked whether it was suggested that BLIPS would make more information available to users than hitherto.

DR NEVILLE replied that one of the reasons for developing BLIPS was that the amount of potentially useful information being produced was increasing more rapidly than the library's resources for processing it. It was therefore expected that a larger data-base would be made available to users and that the system would enable them to search it more effectively. Moreover they would be able to use the system without coming into the library, as the number of terminals around the Establishment increased.

MR M. J. ROWAT (British Sugar Corporation) asked if it was proposed to provide on-line instruction or prompting to aid the users.

---

* Several associated operations necessary in a manual system after the actual cataloguing would disappear in BLIPS, viz typing the catalogues MS sheet, reproducing several card copies from the typed master, underlining manually different headings on each copy, and filing the various copies in different places.

DR NEVILLE replied that no thought had yet been given to this. It had been tried when the present on-line system was designed, but was rejected because it seemed tedious and unnecessary. However with the new, more complicated system it might be worth doing.

MISS E. POTT (Aslib) was concerned about users' attitudes to on-line systems. Infrequent users would forget how to operate the system and revert to using library staff as intermediaries.

DR NEVILLE said that at present the majority of users tended to ask the library staff to operate manual or mechanized systems for them, but since the introduction of mechanized systems 12 years ago, and again since the introduction of an on-line system 18 months ago, there had been a small increase in the number of direct users. He agreed, however, that the very infrequent user posed a problem, not so much because he would entirely forget how to use the system, but because without fairly regular practice he would not get the best out of it and this would damage the image of the system.

MR ELVIN (BRE) said that the allocation of a member of library staff to look after the interests of each research division had been effective in promoting the use of the present system.

MRS P. E. MONGAR (Transport and Road Research Laboratory) commented that the system seemed to have a hybrid rather than an integrated nature, and that subject retrieval seemed to suffer in favour of document retrieval. She would like to see a more comprehensive and more flexible modular system in which each organization could extract those elements that met its own needs. The need to facilitate the collection of statistics was also stressed.

MISS C. HAWORTH (Paint Research Station) was concerned about the ability of non-professional staff to produce the kind of input illustrated (Fig. 1), including foreign titles and selection of significant work.

DR NEVILLE replied that where translation was needed this would have to be provided professionally, as in any other system. The selection of significant words from titles, he suggested, really involved selecting the nouns and could be done without knowing their meaning. With a more difficult item requiring additional tags to be chosen from an abstract, the abstract itself would have to be produced professionally and the abstractor could with little extra effort underline the words to be used as tags.

MR A. D. SHILLINGFORD (J. L. Jolley and Partners) said that since the tag field was intellectually derived, he was not clear what savings would be made in comparison with an established semi-automatic keyword selection system with input editing facilities.

DR NEVILLE did not agree that tag selection had a significant intellectual content. There was some degree of skill in selecting subject words in difficult cases, and this would generally be done by the abstractor whose intervention was necessary anyway; but in all cases the tags were object features actually occurring in the document.

MR BHATTACHARYYA (Polytechnic of North London) had surveyed 98 special libraries. Five of the six libraries replying to a question on the type of language used had discontinued using a controlled language and one was using it only at the search stage.

MR J. BLAGDEN (Greater London Council) asked about the cost and staff saving envisaged.

DR NEVILLE replied that it was very difficult to obtain meaningful comparative costs but the benefit was seen in increased quality and quantity of throughput rather than significant savings in staff costs.

MR G. HIGGENS (BBC) asked if the system would be applicable to a dispersed group of libraries covering virtually all subjects and receiving loan requests by telephone or letter rather than by borrowers in person.

DR NEVILLE replied that the use of natural language would allow any subject to be introduced. Loans recorded in the absence of the borrower presented no special problems—the record would have to be made by the library staff, as in any other system. The only difference was that there would be no means of recording a signature.

THE CHAIRMAN asked if there was provision for calling up a single record if its item number was known.

DR NEVILLE confirmed that this was so.

MR BHATTACHARYYA, commenting on Mr Higgens' question, suggested that a broad subject classification, which might be associated with the location number, could be included in the tags so that it could form part of the search strategy.

MR A. E. NEGUS (INSPEC) asked how the loan system would cater for periodical parts.

DR NEVILLE said that it was not intended to cover this because most libraries tended to photocopy periodical papers rather than to lend the parts. However, the record format could be used to record periodical part data, and if these records were given the zero prefix, they could be associated with a loan record.

MR P. ADAMS (Welding Institute) asked if the loan record made provision for a waiting list.

DR NEVILLE replied that there would not be room for this, but the 'comment' part of the loan record could be used to draw attention to the fact that there was a waiting list.

MR C. WILSON (AWRE, Aldermaston) enquired whether the abstracts could be made available to other users on tape so that they could search them themselves.

DR NEVILLE replied that the possibility had been envisaged of providing a service whereby outside users with terminals could dial in and use the system themselves, subject to certain safeguards. It would also seem feasible to supply tapes containing selected parts of the data bases.

MR P. HARRIS (Warren Spring Laboratory) felt that an important aspect of the system was the multi-purpose use made of a single machine-readable record. A printed recall slip would be preferable to a list of overdue loans. Including the country of origin as a tag could cause confusion when a country was part of the subject.

DR NEVILLE agreed that printed recall slips would be useful to consider as a possible extra feature. The suggested use of UDC country codes for tagging the origin of documents overcame the possible confusion with names of countries appearing as subject tags.

MR G. R. ALLEN (Unilever Research) asked what regard had been paid to other systems with a view to adopting suitable modules to reduce development costs.

DR NEVILLE replied that experience tended to show that trying to adapt software from other systems was generally more trouble that it was worth.

MR D. FERGUSON (AWRE) asked if the use of MARC or any other such system had been considered.

DR NEVILLE said that owing to the small overlap between the coverage of MARC and the interests of any typical special library, he did not see MARC as being relevant to special libraries' needs in the foreseeable future.

MR A. DEVONALD (Hutton and Rostron) appreciated the simplicity of approach, and if it could be implemented at a reasonable cost, it seemed to be right. He felt that the computer should be seen as a hidden intermediary between the natural language of input information or of requests and the stored material. He was engaged in work on the automatic coding of natural language for search purposes.

Computer aspects of the BLIPS system: a discussion

L. S. Vallance

BRE Computer Unit

Paper presented at the BRE Symposium on A comprehensive on-line computer system for special libraries, Garston, December 1974

WHAT I WOULD like to do is to survey the field briefly to get the perspective of the problem, to mention some of the problems that may arise, and in that way to initiate a discussion. I shall be grouping my remarks under four headings. First of all under size, magnitude of files, and so on. Secondly, timing, mainly the question of response of the terminals. Thirdly, something about hardware, in particular in relation to the communications aspect. And finally, a brief look at security.

On the question of size, first of all of the main file; for this I shall take a situation where one has about 50,000 items, a figure which arose from the floor this morning, so it seems a reasonable target to aim at. The main information will probably consist of at least 100, and probably averaging about 200 words per item, if only because the abstract will be included, and again it appears from this morning's discussion that the abstract would be at least a very useful guide to the tags that will be selected for the actual information retrieval. So on that basis one has a main file of the order of 5–10 million words. A year or two ago this would inevitably have meant magnetic tape, and today of course, it could be achieved on EDS storage. As against that, it is, if not dead storage, at least storage that is not going to be demanded so much as the brief information material, so it would seem uneconomic to put it onto an EDS backing. In any case, as the system grows, it would seem essential to provide some sort of magnetic tape facility in order to carry that part of store.

When we come to the actual working store, the fast access backing store, we have to consider several different types of files. Nearly all these schemes tend to start off with what is in effect a concordance, a file which will consist only of the tags, their frequency of occurrence, and possibly a little housekeeping material for the computer program itself, things like the internal code of the tags, which can be more condensed than the tags themselves. This can be quite a sizeable file, depending on the number of tags, and this goes back to the point which was raised this morning—how many tags does one expect per item. I understand that it is likely that each item would produce about nine unique tags, that is, they refer to that item only, and a number of tags which will be more or less common to other items; the average figure for the total number of tags is 20, so one would expect about 11 or 12 tags which are common to various items. That is not, of course, the complete story, because one has to consider how often

Aslib Proceedings 27 (5), May 1975, pp. 204–209. Printed in Great Britain

a common tag occurs as a common tag and a reasonable assumption seems to be that on the whole there would be 3 common tags per item, so this gives one a total of 12 tags per item. If one accepts that assumption, the data base of 50,000 items would have 600,000 tags.

The tag file itself is not going to require a lot of information per tag, say 10 computer words of about 4 characters, which might be 32 bits—4 × 8-bit characters, but it's not far removed from the idea of a normal word. So, on that basis, the tag file itself could be about 6,000,000 words. The main purpose of this tag file is to lead one to an index file which has to have for each tag a code leading to the actual brief record, so there is a second file, which will also have 600,000 items. Again it won't need a lot of information for each item (this will be mainly of the computer housekeeping type) so if we assume 5 words per item, that gives us a second file of about 3,000,000 words.

Finally one has to have the brief item details themselves on line. Here there are 50,000 items, and from the information that Dr Neville gave previously you will realize that there would be about 30–40 words in the brief description. This gives one about 1½ million–2 million words. If you total those, you will find that there are about 10 million words. This is why we reckon an EDS will last us for about 4 years, because within 4 years we shall have built up about 50,000 records and an EDS 60 takes 15 million words. Obviously one has to put the programs on it and there will be other files, the updating files and so on. So this is the order of magnitude at any rate, one EDS 60 for a 50,000 item data base.

It is perhaps worth thinking a little about this question of tags per item because one can get very different estimates, and if one goes to one extreme like the STATUS system developed by Mr Price at Harwell, which was concerned with mainly legislative literature originally, I think, atomic energy legislation, and later EEC conventions and such like, it was found that for this purpose the number of different words, which are, in effect, tags, was only of the order of 6,000–7,000, depending on the language. Yet the total number of words in the document would be about 200,000. There one has a very great reduction from the number of items to the number of tags. This example is rather extreme because the subject matter is limited, not like a scientific or technical library today where even if one considers only new technical terms there will be a growing number of tags. A litle nearer home is the INTREX system, which is being developed at MIT. They set up an information retrieval system which covered a limited field of scientific research–four related physical science fields and one rather unrelated engineering field. They built up this system to have about 20,000 entries, and at that time they had 31,000 tags (this was subject matter tags only but with about 18,000 author names) however, 20,000 entries gave rise to about 50,000 tags, a factor of only 2 or 3 to one. This suggests that our estimate is possibly an over-estimate.

Dr Neville mentioned previously that one might well have to look at the tags as time goes on, and in fact it is not inconceivable that one can build into the system some self-regulating mechanism which would reject tags which prove to be useless for one reason or other, typically the fact that a tag covered too many items would be simplest criterion for rejection, or possibly when a tag is found to be effectively a synonym to another tag that already exists. I am perhaps drawing a distinction here between an effective synonym in the sense that the computer program finds that for its data base two words are synonymous whereas they may not be synonymous to the average user who is presented with them. At any rate, there is a possibility that one could build in certain regulatory devices which would cut down the number of tags. The problem possibly would be to pass the information back to the user in the form which he could make use of in making his enquiries.

Now I would like to go on to consider timing. Here again the only place where timing is important is for the on-line enquiry. If the terminal is used merely to input data which are going to be processed overnight or when convenient, the response is not important, but when one is searching, when one is actually using the information retrieval facility, one does need a rapid turnround. If our estimate of 600,000 tags is of the right order of magnitude, then at least one can say that the 'bull at the gate' approach for searching will not be very profitable. I will not go into the details of the calculations but roughly speaking, if the program searches in a straightforward manner through 600,000 tags, with the present EDS technology this could lead to a search time alone of about 30 seconds. This may not seem a great deal, but when one realizes that it is the *minimum* search time it probably is reaching the stage where one should consider more sophisticated techniques for entering the tag file from the given search profile. I am not suggesting that our problem is insuperable: there are techniques, but it is as well to know that there are some program problems and one of them is to structure the data to the best advantage. The obvious thing to do would be to arrange the tags alphabetically and go into them in some way depending on the alphabetical position of the tags. But the other possibility again, which was mentioned previously by Dr Neville, would be to group the basic data base into different areas, for example into different subjects or according to date.

Of the hardware configuration itself, I am thinking at the moment of the installation characteristics, as it were, as a whole. We certainly have in mind the situation at BRE where we have geographically separated Stations which have certain links, so that one has a range of possibilities in the computer configuration that might be used. On the one hand, one might be in a position of being able to use an existing main-frame installation and all users would just enter this directly on what is called a star network, and all the data would be held and processed by the main installation. The other extreme would be to have a dedicated system in which each geographical locality had a smaller installation, probably a mini-computer which dealt with its main data base which was relevant to that locality, but with all the geographical situations interlinked by communication facilities. Of course, one can have various intermediate systems whereby one has a main-frame in the background and various satellites at the different localities. There are a number of advantages and disadvantages in these schemes. If one has a main central processor one may be in a position of having to make, or being able to make use of existing facilities. There may be an operating system which enables one just to tack on additional terminals, and it may be no problem to enhance the backing store facilities to cope with the data.

Another perhaps minor advantage, and one perhaps looking a little far ahead, is that there may already be information existing in data bases on the main frame which could be valuable to the BLIPS system, and what comes to mind here are things like staff lists which would provide one with a list of borrowers and would be updated independently of the library system itself. It has the advantage that any archiving of the records could be done centrally. The disadvantage of such a system, the main one perhaps, is that the response will depend on the load, if there is batch processing going on, and other terminal users. Then the response to the BLIPS system may depend very much on how many other users are operating at the same time. Another disadvantage is that one is dependent on a single main frame; any breakdown affects all the Stations at once and no work can be done. A third disadvantage at the moment is that if security is a major problem, then the facilities offered by current main-frame installations may not be really adequate. The advantages of a distributive system are, as one might expect, the opposite sòrt of things: such a system can be tailor-made for the application, and as a result, if it is dedicated to that use only, the response time can be made predictable, I won't say constant, within certain limits. It is also possibly true to say that in this field the communications facilities may be better and more reliable. There may be an advantage in having the resources scattered, again because of possible failure or breakdown, when not everything would be lost at once. The disadvantages are that it may be difficult to devise such a system which is not under-used, and it may be difficult to enhance as the load increases. There may of course be disadvantages because the resources are scattered.

So much for the type of installation that might be used. Finally a few words about security. The problem here I think is to know what level to aim at. The demand is likely to range from nothing more than a minimum requirement to protect the loan record; a minimum in the sense that one does not envisage any great desire to corrupt the loan record, and one merely wants to make sure that only authorized people can change it. At the other extreme there may be establishments which have fairly stringent requirements to protect secret information. At the lower end there should be no difficulty in meeting the demands with current operating systems and hardware but at the more stringent end, I think we are perhaps getting near the borders of present-day technology. There is work going on along these lines, but it is not readily available at the moment. The point is that the hardware facilities for a really secure system do not exist on previous generations of computers, they are just coming in with the new ones. One might have a minor security problem here in connection with the point which was raised previously, that of the distinction made between the terminal being operated on the one hand by the library staff and on the other hand by the ultimate user, the actual borrower. Clearly in general terms it is desirable that only the library staff can alter certain items; roughly speaking the borrower should have read-only access to the system whereas the library staff would want write-only access as well.

I must sum up by indicating the magnitude of installation that might be required to cover this sort of scheme, even if only in general terms. Starting at the heart of the matter, the central processing unit, here I do not think there is any real difficulty, at least as far as hardware capability is concerned. Most central processing units now would have instruction times of the order of one microsecond and it would seem at first sight that this would be adequate for the sort of speeds required provided that reasonable attention is paid to the software. This would be associated with the core store which one suspects would have to be fairly large, depending on whether one has a main central installation or a number of isolated mini-computers, but in either case one wants a fair core store because there are searches and sorts which are much more efficiently done if there is a fair amount of core to do it in. Again this is probably no real problem these days. One would need a fairly fast access to the core store, but access of one microsecond is quite common. As regards the backing store, we have already seen that the order of magnitude is a minimum of about one EDS 60 (60 million characters) and current developments are producing similar devices which have a capacity of 120 million characters, so that this again should be no problem. We also would appear to need to associate a magnetic tape backing store facility, at least two decks but probably not more than four, and one would need the usual peripherals, line printer, card reader, as well as the VDU terminals, and so on. I expect many librarians will already know that we are at least getting line printers which can print both upper and lower case characters, and I think this will almost certainly be an essential requirement. Another facility which might be added in the future, one many libraries I think will find invaluable, would be computer output on microfilm.

That I hope gives you a broad picture of the magnitude of the problem, and I am sure that many of you will be able to contribute much more from you own experience.

DISCUSSION

MR D. F. DANCY (UKAEA Culham Laboratory) said that search time and cost depended on the size of the tag file and involved EDS transfer time. If the information retrieval and stock control functions were separated, the tag file could be a half to a third of the size suggested.

MR VALLANCE replied that EDS transfer time had been allowed for in his estimate of search time, and the estimate was based on a very crude search routine which would be unlikely to be used in practice.

MR W. S. ATHERTON (Meteorological Office) asked for details of the structure of the tag file.

MR VALLANCE replied that a 3-level structure was envisaged. The tag file was intended to produce the first response, the number of hits. This file would contain merely a list of tags, their internal codes (used for searching other files) and the frequency of use of each tag. Secondly, there would be an index file linking the tag codes to the brief records file. Thirdly, there would be the brief records file itself.

MR ATHERTON commented that the tag file would have variable length records and would have to be searched several times, thereby prolonging the record time with complex profiles.

MR VALLANCE replied that the suggested 30-second search time was almost certainly an overestimate, and attention to the search strategy, making use of the frequencies of use of the tags in the profile, could materially reduce the search time.

MR DANCY said that large commercial systems used inverted files with a limited number of tags (*i.e.* a thesaurus). A natural language system would probably have to use a serial file.

MR E. SMITH (Central Computer Agency) asked if the tag file corresponded to the 'concordance' file used in the AERE 'STATUS' system.

MR VALLANCE said that this was so.

MR R. A. MACDONALD (Technology Reports Centre) pointed out that it was helpful in constructing profiles to be able to display a list of available keywords or tags related to a chosen one—alphabetically related in the case of truncated tags, or hierarchically related if the system is based on a structured thesauras.

MR W. B. BANKS (Princes Risborough Laboratory) asked whether rapid response was so important for the user; information retrieval searches on a batch basis might be acceptable.

MR VALLANCE replied that a response time of, say, 5 minutes might be acceptable economically, but could be unacceptable for psychological reasons. On-line users tended to get impatient after a delay of about 30 seconds.

MR A. E. NEGUS (INSPEC) quoted figures from INSPEC free language searching experience in support of Mr Vallance's estimates of number of tags, *e.g.* it had been found that 20,000 records generated 25,000 tags. Regarding response time, Mr Vallance's estimates seemed to be unduly pessimistic. The RIOT system at Culham could search 40,000 records with a maximum delay of 35 seconds, and a typical delay of 5 seconds. The RECON system normally produced some response in seconds rather than minutes. In reply to Mr Banks, interactive searching was essential for a natural language system.

MR A. DEVONALD (Hutton and Rostron) commented on the search strategy. If one started with too narrow a profile one would get silence, whereas if one started with a very broad profile one would get many items which would then have to be searched in detail. One could consider generating a subfile from the result of the broad search which could then be explored very rapidly. One might also consider allotting different times of the day for on-line and batched requests.

MR J. BLAGDEN (Greater London Council) emphasized that it was generally agreed that the use of a computer was justified on the basis of improving the quality of the service rather than reducing the cost. Manual systems gave instant access and the idea of batching requests was a retrograde one.

THE CHAIRMAN reminded the meeting that it had been pointed out that profile amendment was a necessary feature of searching and this would be impractical with batch working.

LIBRA INFORMATION SYSTEMS LIMITED

Specialists in mechanised retrieval systems

... announce the development of a dedicated *minicomputer system* designed to meet the needs of most Library/Information departments.

* Up to 100,000 references accessible on-line.
* In-house security, availability and control.
* Fast interactive searching.
* Current awareness, SDI and printed index generation.
* Pre and post-coordination facilities.
* Built in term control defined by the user.
* Full editing capabilities.
* Operated by library staff.

For further information please write to:

Technical Sales Manager
Libra Information Systems Ltd., Chaudhuri House,
Addington St., Margate, Kent CT9 1PW Ref A/10.

Extended use of the BLIPS system

P. J. Elvin and H. H. Neville
BRE

Paper presented at the BRE Symposium on A comprehensive on-line computer system for special libraries, Garston, December 1974

Abstract
The possibility of using the BOSS system with a controlled language thesaurus is discussed and the ways in which the system could be used for producing journal listings and for storing, indexing and retrieving diagrams and configurations are described.

Introduction

This paper is to be regarded as a supplement to the description of BLIPS given in a previous paper. In that description emphasis was placed on the use of the system for information storage and retrieval and document cataloguing. The aim of this paper is to indicate some ways in which the system may be used in addition to those described. I underline 'in addition' because it is not intended to assert that the operations to be discussed should be primary uses of the BLIPS system, I merely wish to point out that if anyone has got together all the programs and machinery for doing free language indexing (fli) in the manner described in the previous paper, then other uses of such a system are feasible.

The item number field

First I shall discuss the way in which the item number field might be used so that the files could accommodate several data bases. This a small but quite useful feature. By careful selection of blocks of item numbers it would be possible for individuals to be allocated a section of the data base for their own purposes, independent of the library's usage.

The item number consists of a letter which indicates the library which 'owns' the item, the second character is a number indicating the type of item, next come the last two letters of the year of publication, and finally a 5-digit number, which can be used to number up to one million items.

e.g. A074 12345

For BRE Library we at present envisage using A0, A1, A2, B0, B1, B2, C0, C1, C2, which would leave A3–A9, B3–B9, C3–C9, and all combinations using letters D–Z inclusive free for use by individuals outside the library. In all there are 260 possible combinations, and there would thus be 251 available for other users.

It might be necessary to keep the tags used in such collections separate from the tags used by the libraries. When print-outs of all tags are obtained, tags used for non-library data bases should be separated or distinguished from tags

Aslib Proceedings 27 (5), May 1975, pp. 210–216. Printed in Great Britain

generated by the library. Further, the tag frequencies displayed on a VDU should relate only to the frequencies in the part of the data base being searched.

Use of a fixed thesaurus

Next I shall discuss the use of BLIPS with a fixed thesaurus for subject indexing instead of using fli. It is assumed that the use of fli for bibliographic entries is acceptable but that its use for subject indexing is considered unsuitable.

There is clearly no reason why the entries in the tags field should not include descriptors from a thesaurus provided each descriptor conforms with the conditions imposed on tags as regards length and terminations, *i.e.* a tag is a single character string between spaces with a specified maximum length. Multi-word descriptors could be troublesome and it would probably be advisable to make them formally single words by hyphenation.

However, it is important to remember that descriptors entered in the tags field wrongly spelt or in a grammatical form different from that used in the thesaurus will be accepted at input, and consequently searches, which will be carried out using descriptors in the form used in the thesaurus, will fail to retrieve items indexed by an incorrectly entered descriptor. It would of course be possible to store the thesaurus on a file and check the descriptors used on each new item indexed. Such a method is used in our existing system, Libindex,[1] but the use of it here may lead to complexities which are best avoided.

Another method is suggested which requires periodical inspection of tags as they are used for indexing. Consider the tags which, in some known period, have been used for indexing. Each tag can be put into one of four categories, viz:

(i) it is being used for the first time and is correct, *i.e.* it corresponds exactly with the thesaurus form
(ii) it is being used for the first time and is incorrect, *i.e.* it differs from the thesaurus form
(iii) it has already occurred one or more times in its correct form and is being used in an incorrect form, (a) for the first time or (b) for the rth time, the previous (r-1) incorrect occurrences having been detected and corrected
(iv) it has already occurred one or more times in its correct form and is in its correct form.

All that is required is a listing of the first time occurrences (categories (i), (ii), (iii)a, and (iii)b), which would not of course be differentiated). This could be examined and appropriate action taken. Clearly category (i) would require no action; in the cases of (ii) and (iii) either the 'wrong' descriptor would be corrected or, if acceptable, it would be admitted as a synonym of the existing term and the thesaurus revised appropriately.

The adoption of such a technique would make possible the use of a fixed thesaurus and avoid retrieval failures caused by the use of descriptors not in the thesaurus.

Journal listings

The BLIPS system provides for the print-out or display of various combinations of the input fields listed in the previous paper. It is suggested here that some of these combinations could be used to produce complete or selected listings of journals subscribed to by the library. Consider the combination of fields 1, 2, 3, 5, 6, and 8. This combination is printed out in response to a request for full records of items retrieved in a search. Some of the fields may be left blank, others have to be occupied by some minimum content. The figure below shows a minimum output, *i.e.* a display in which empty fields occur and in which other fields have their minimum allowable content. It is assumed that field 8 (tags) can be suppressed at output. Field numbers are given in brackets.

(1) (2) (3)	A974 12345	Blank	Blank
(5a)	Dummy		
(5b)	Blank		
(5c)	Blank		
(5d) (5e)	— —		
(6)	Blank		

FIG. 1: *Minimum output from fields 1, 2, 3, 4, 5, and 6*

If we now enter a formatted journal title and characteristics in field 6 we shall get the following type of print-out.

A 974 12345
Dummy
— —
Architects Journal CGB FW LB K15 AB PH15

FIG. 2: *Typical journal entry; title in field 6*

Tags for this journal would be CGB (country), FW (frequency, weekly), LB (lease of life, bound), SK15 (supplier and number of copies), AB (classification of subject content), and PH15 (price code and number of copies). The initial letters C, F, L etc. would be essential to differentiate between the various characteristics.

On the other hand it would be possible to use field 5b, in which case we should get:

A 974 12345
Dummy
Architects Journal CGB FW LB SK15 AB PH15

FIG. 3: *Typical journal entry; title in field 5*

Tags are as before.

The advantage of using field 6 is that one could make use of its large capacity to accommodate long titles. If, however, the second method described above is used, field 6 could be used to contain a formatted journal record sheet, print-out being either a simple journal list or a list consisting of each journal and its characteristics followed by a record sheet. The item numbers and dummy entries above might also be suppressed at output. Clearly it would be possible by selecting tags for searching to obtain special listings if required *e.g.* all British journals, all journals covering a specified subject field etc. It would also be necessary to add a general descriptor such as 'JOURNALS' so that all journal entries could be retrieved at one go.

It would also be possible to use the VDU display. This makes use of fields 1, 2, 3, and 4, only and the minimum display is:

(1) (2) (3)	A 974 12345	Blank	Blank
(4)	Dummy		

FIG. 4: *Minimum VDU display*

Journal title and characteristics would be entered in field 4, the disadvantage being that it is limited to about 80 characters, *i.e.* one line of VDU. Characteristics would probably require a maximum of 25 spaces leaving about 55 for the title. This would be sufficient for a large number of titles (judging by our own experience) but judicious shortening would have to be used for long ones. The format would be:

A 974 12345
Architects Journal CGB FW LB SK15 AB PH15

FIG. 5: *Typical journal entry on VDU*

Printed journal lists could be obtained on-line if printing equipment, *e.g.* a thermal printer, were used in conjunction with the VDU.

Other records

Clearly the journal listings are just one example of the use of the programs for the storage and retrieval of information other than details and descriptions of books and documents. Other uses suggest themselves. For example we might consider its use for storing information about our document exchange arrangements with other organizations.

Over the years we have made a large number of such arrangements with research organizations all over the world. A typical exchange record will consist of:

(i) name of organization
(ii) country in which it is located
(iii) main research interests
(iv) types of documents we receive, including serial titles, house journal, etc.
(v) documents we send *e.g. Current Papers, Digests, BRE News* etc.

These features could be used as tags and entered in the various fields according to the format required. The exchange file could be generated in the form of item cards. Queries of the type 'Who takes *BRE News*' or 'What are we supposed to receive from 'The X Research Institute' could be dealt with by ordinary search principles.

Indexing and retrieving shapes

As a final example of the way in which the BLIPS programs and fields could be used, the storage and retrieval of shapes and configurations will be briefly discussed.

It would be a simple matter to devise an input punching document using a grid in the abstract field (6) within which a configuration could be defined in

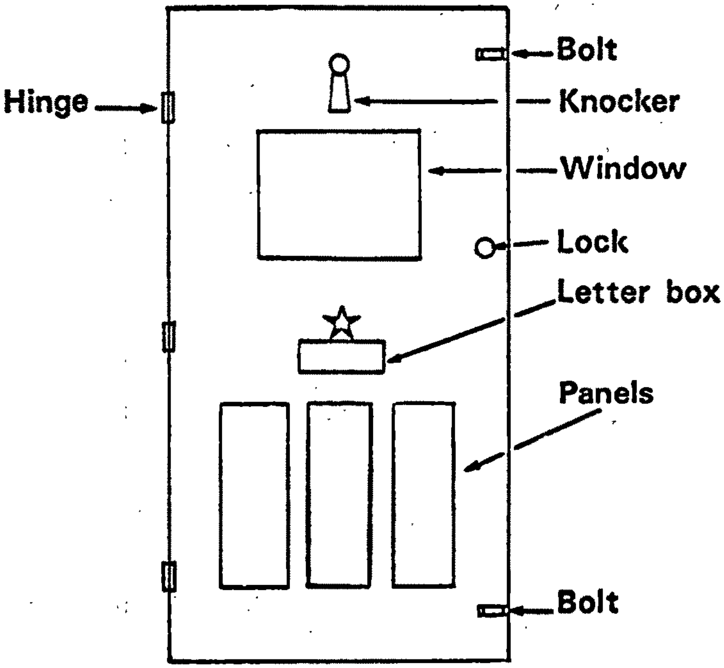


FIG. 6: *Sketch of door*

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
A																				
B																				
C							•								•					
D															B					
E							H				K									
F																				
G									W				W							
H																				
I																				
J									W				W		Lk					
K							H				☆									
L										L	L	L								
M																				
N									P		P		P							
O																				
P																				
Q							H													
R									P		P		P		B					
S							•								•					
T																				
U																				

FIG. 7: *Door as transferred to input/search grid*

terms of the co-ordinates of points on and within its boundary and the features at those points.

Consider for example the door shown in Figure 6. When transferred to a grid it might be represented as shown in Figure 7, and the tags to define this configuration would be:

(C7 corner), (E7 hinge), (E11 knocker), and so on

each tag consisting of the co-ordinates of a feature and the name of that feature. In addition there would be tags to describe features which can not be illustrated, such as material, colour, etc. A search for a particular configuration would be carried out using a grid identical to the input grid, on which enquiries would be framed and the search profile compiled by reading off the co-ordinates of features specified by the requester. The results of the search could be in the form of references to catalogues or stores numbers, and these would have been entered at input in one of the other fields. If required, the output could include a reproduction of the input configuration. The technique could be applied fairly easily to regular shapes such as squares, rectangles, ellipses, and circles. Conventions would have to be established for the positioning and orientation of the configurations on the input documents and these would be used on the search grid, otherwise identical configurations would be tagged with different co-ordinates. This technique might conceivably be used for specifying, storing, and retrieving the chemical structures of organic compounds.

For this particular application *i.e.* indexing and retrieving shapes, the free language aspect of the BLIPS programs would be essential, since it would be impossible, or at least impracticable, to compile in advance a thesaurus composed of terms representing all possible points on the grid, each combined with all possible features which might be located at these points. In addition circumstances can be imagined under which searches with a truncated co-ordinates/feature tag would be of value.

REFERENCE

1 PRANGNELL, R. D. *and* ELVIN, P. J. 'Information retrieval by computer at the Building Research Establishment Library', *Information Scientist*, 9, (1), 1975, pp. 3–17.

FINAL DISCUSSION

MR R. H. SEARLE (Transport and Road Research Laboratory) asked whether it was intended to distinguish subject tags and other tags.

DR NEVILLE felt that the scope for confusion was not very large, *e.g.* authors' name tags included initials which would generally destroy their possible identity with subject words. However, types of tag could be distinguished if necessary by using non-alphabetic prefixes, *e.g.* £BRIDGES—might represent a (truncated) author name and $BRIDGES a subject tag.

MR A. GILCHRIST (Aslib) asked for an explanation of the 'house rules' proposed to aid in the formulation of input tags, and of how the change of terminology with time could be dealt with.

DR NEVILLE replied that for example it might be necessary to lay down guidance on the handling of hyphenated words, chemical, botanical terms, odd terms like 'PRIMASTAHL X5' in Figure 1, and some guidance on the depth of indexing or average number of tags to be aimed at. It was recognized that the terminology of a subject changed with time, and one would have to take account of this in searching, as was necessary at present with 4 separate indexing systems spanning 50 years. Some form of thesaurus applied at the search end might be needed after a period of years if searching the older records became a problem.

MRS P. E. MONGAR (Transport and Road Research Laboratory) asked if any comparative studies had been made to assess the cost/time efficiency of undertaking the intellectual effort at input or output.

DR NEVILLE stated that tests had been prepared to assess the effectiveness of natural language indexing and these were awaiting completion. He was sceptical about the validity of timing studies unless the results were averaged over a large number of tests and there was not time available to do this.

MISS E. POTT (Aslib) asked if any evaluation was proposed after setting up the system.

DR NEVILLE admitted that the approach was pragmatic. However, a facility for compiling statistics during use of the system would make its evaluation easier.

MR R. ARDERN (British Steel Corporation) asked if it was intended to input machine-readable data from other sources.

DR NEVILLE said that it was hoped to be able to do so. It would depend on whether the other data could reasonably easily be re-processed to suit the BLIPS structure. Owing to the fairly unrestricted nature of the BLIPS format it was likely to be easier to convert other data-bases to BLIPS than conversely.

MR ARDERN asked also if there were likely to be problems with ICL/IBM compatibility.

MR VALLANCE said that at some stage in the development a decision would have to be made to relate the software to a particular type of machine. Rewriting for a different machine would be costly, but would also increase the number of potential users.

MR M. ROPER (Public Record Office) said that the BLIPS tag system did not seem appropriate for a collection covering a very wide subject field where more traditional methods of archival practice would be more suitable.

MR SEARLE said that a comprehensive system should gather as much library management information as possible, *e.g.* on usage of stock.

MISS C. HAWORTH (Paint Research Station) added that the large cost of designing and running the system made it necessary to get as much information out of it as possible.

MR VALLANCE commented that the running cost would not depend very greatly on the size of the files, it would depend more on the file structure.

MR A. E. NEGUS (INSPEC) pointed out that batched searches run off-line would not allow amendment of the profile. Even with a controlled language it was difficult to get the profile right the first time; with natural language it would be more difficult.

MR W. B. BANKS (Princes Risborough Laboratory) queried the use of VDU's rather than teletype terminals which would give a permanent record.

MR VALLENCE commented that hard-copy attachments for VDU's were obtainable. It was also a question of noise.

MR G. R. ALLEN said that an important reason for using VDU's was the data entry facility they offered.

DR NEVILLE said that it was proposed that the program should assist the input operator by displaying the field structure. Furthermore, it was easier to amend a profile on a VDU by deleting parts of it. With a teletype the whole profile would have to be re-written.

MR J. C. MCCLELLAND asked about control of indexing depth, titles for example varied greatly in length and information content.

DR NEVILLE said it would be a matter of co-operation between the input operator and the professional supervisor. A fair proportion of items could be passed straight to the operator, others would need to have some brief annotation from the supervisor before being passed to the operator. One also came across series of reports which were individually difficult to handle, but if the first one were handled by the supervisor, the operator could handle the rest.

MR BANKS said that the discussion had centred on a 50,000-item date-base covering 4 years. Had any thought been given to the longer term?

MR VALLANCE replied that one could not reasonably foresee very long term developments, but having got the data-base in machine-readable form one would hope to be able to convert it automatically to some future system.

DR NEVILLE added that the data-base was intended to be divided into sections such that most of the time one would be searching only one section. Each section could grow to 50,000 items and it would be reasonable to tolerate some delay in the infrequent cases where one wanted to search more than one section.

Patterns of information flow during the innovation process*

Roy Rothwell

Science Policy Research Unit, University of Sussex

1 Introduction

THERE IS A COMPREHENSIVE and growing body of empirical evidence, gathered through retrospective studies of innovation attempts, which demonstrates clearly that good communications, with the consequent efficient flow of information both within the innovating organization and between the organization and its environment, is a prime requisite for innovative success. [1,2] The relative importance of literature and other formal sources of information utilized during innovation, in relation to informal interpersonal sources will be mentioned only briefly since this topic has been discussed at some length elsewhere.[3]† This paper represents an attempt to analyse some of the available empirical data which relate to the information seeking habits of innovators in their search for scientific and technological information. It traces the patterns of search through the various phases of the innovation process, discusses the different information seeking habits of scientists and technologists, describe the effect of firm size on the pattern of information search and highlights the necessity of matching the degree of complexity of a message to the level of sophistication of its recipient. Finally it discusses the significance of these findings to those whose task is the management of innovation.

2 Patterns of information flow during innovation

It can be seen from Figure 1 that there are three main sub-processes contained within the overall innovation process: idea generation, problem solving and implementation and diffusion. Most of the scientific and technological information requirements for the innovation will be met during the first two of these sub-processes and this section considers the sources of ideas utilized during idea generation and those used in problem solving, and establishes differences between the two.

2.1 *Sources of ideas leading to innovation*

In this section data relating to the sources of ideas which actually led to the initiation of new developments is presented.

---

* The definition of innovation employed here is: 'the technical production and commercial steps which lead to the marketing of a new product, or the first commercial use of a new process or equipment'. A simple model of the innovation process is given in Figure 1.

† The great majority of studies suggest, in fact, that the bulk of information utilized during innovation is 'person embodied' rather than transmitted via the printed word.

Aslib Proceedings 27 (5), May 1975, pp. 217–226. Printed in Great Britain

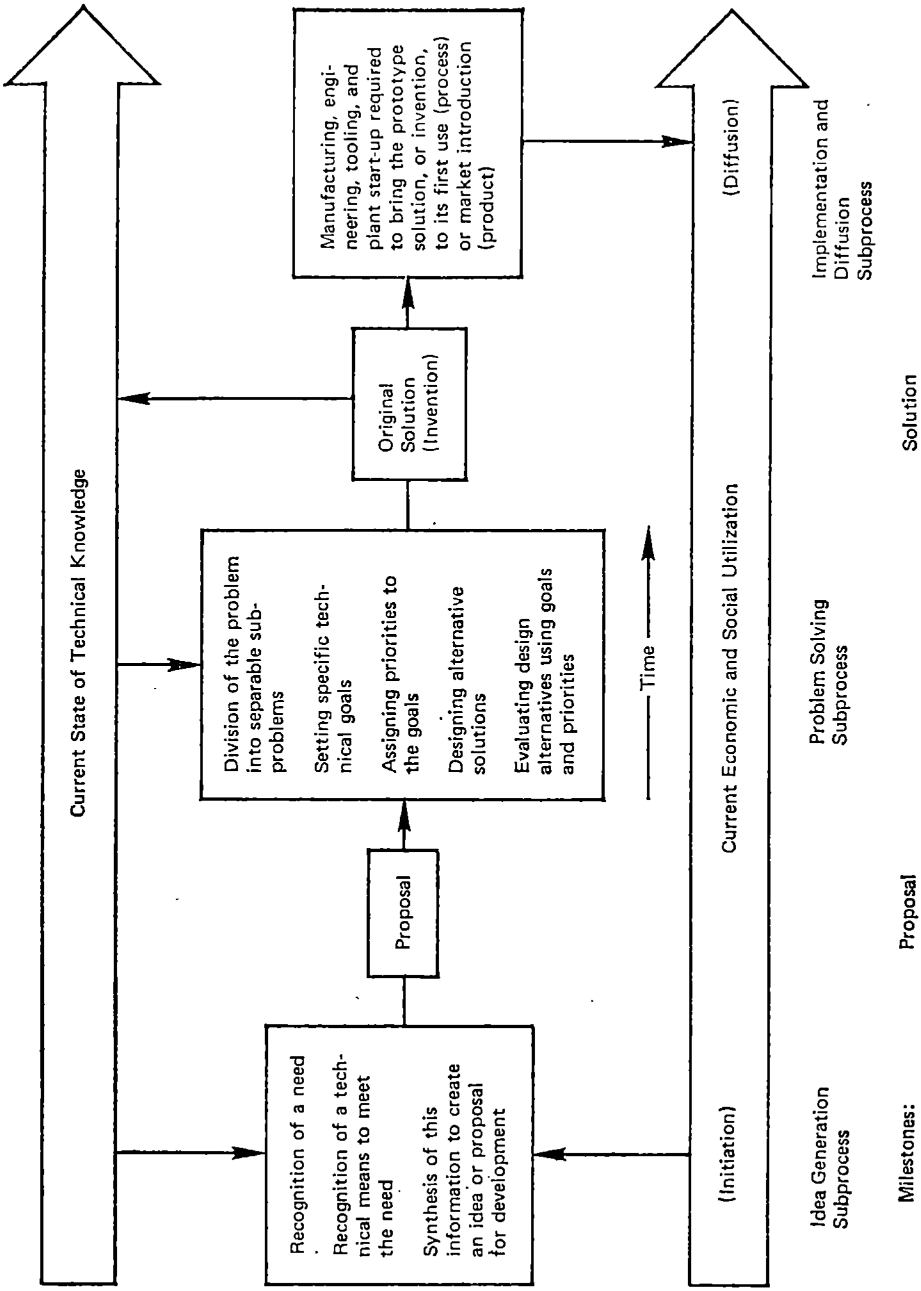

Current State of Technical Knowledge
Recognition of a need
Recognition of a technical means to meet the need
Synthesis of this information to create an idea or proposal for development
Proposal
Division of the problem into separable subproblems
Setting specific technical goals
Assigning priorities to the goals
Designing alternative solutions
Evaluating design alternatives using goals and priorities
Time
Original Solution (Invention)
Manufacturing, engineering, tooling, and plant start-up required to bring the prototype solution, or invention, to its first use (process) or market introduction (product)
(Initiation)
Current Economic and Social Utilization
(Diffusion)
Idea Generation Subprocess
Problem Solving Subprocess
Implementation and Diffusion Subprocess
Milestones:
Proposal
Solution

FIG. 1: *The process of technical innovation*

Reproduced from J. M. Utterback, 'The process of innovation, a study of the origination and development of ideas from new scientific instruments', *IEEE Transactions on Engineering Management*, EM-18, 1971, p. 124.

2.1.1 *Myers and Marquis*[4]

Myers and Marquis studied 567 successful innovations in the U.S.A. which were spread over a number of industries (railroads, railroad suppliers, computer manufacturers, computer suppliers and housing suppliers). They identified 153 major inputs from sources which unambiguously evoked the basic idea for the innovation. The institutional sources of these ideas were as follows:

59.5%	private industrial organizations, including the innovator
15.3%	vendor or potential supplier
3.3%	government agencies
20.9%	unknown

2.1.2 *Project SAPPHO*[5]

Project SAPPHO studied a total of 86 innovations, 43 successful, 43 unsuccessful, in two industries: chemical processes and scientific instruments. (There was no correlation between the source of an idea and either success or failure.) The sample was international.

The 86 ideas that stimulated innovation derived from the following sources:

		Externally originated ideas as a percentage of all externally originated ideas
53%	in-house	—
18.5%	private industry	39%
10%	universities	22%
5%	individuals	11%
13.5%	government agencies	28%

2.1.3 *Bolton Committee of Inquiry on Small Firms*[6]

This was a study which sought the contribution to post-war innovations in the U.K. from firms of different sizes. The study listed the sources of ideas which led to initiation of 1,667 important successful innovations in manufacturing industry.

The distribution of ideas, by source, was found to be as follows, aggregated for firms of all sizes:

53.7%	in-house
2.53%	university
6.88%	government agencies
4.2%	research associations
17.6%	private industry
13.74%	abroad
1.25%	private individuals

2.2 *Sources of ideas utilized during problem solving*

In their section the sources of ideas which were used in the solution to problems encountered during the course of the innovation will be listed.

2.2.1 *Myers and Marquis*

Myers and Marquis identified 414 major information inputs in their investigation which expedited the solution to an important problem encountered during innovation. The sources were as follows:

46%	private industry, including the innovator
14.3%	vendor or potential supplier
3.0%	government agencies
36.7%	unknown

2.2.2 *Project SAPPHO*

Firms utilized 53 external agencies as sources of scientific and technical information which was used during the innovation:

41%	private industry
19%	universities
4%	individuals
22%	government agencies
4%	research associations

2.2.3 *Langrish*

Langrish studied 82 innovations in the U.K., which gained the Queen's Award to Industry for Innovation. The sources of 102 external ideas made use of in 51 of the innovations were identified:

64%	private industry	(23% U.K., 26% U.S.A., 15% other)
21%	government	(17% U.K., 2% U.S.A., 2% other)
10%	university	(7% U.K., 0% U.S.A., 3% other)
7%	Second World War effort	

A number of conclusions regarding industrial innovation can be drawn from the above data:

(a) private industry plays the major information providing role during project initiation and problem solving in both the U.K. and the U.S.A.

(b) government agencies appear to play a more significant role in the U.K. than in the U.S.A. in providing both idea generation and problem solving information. It is possible that this reflects the higher level of Government funding of private industry R & D in the U.S.A. compared with the U.K. resulting in greater in-house R & D capability on the part of American firms.*

(c) according to Myers and Marquis and project SAPPHO there exist remarkable similarities between the institutional sources of ideas used in idea generation and those used during problem solving.

3 In-house vs external sources

It was seen in the preceding section that similarities exist between the ***institutional*** sources of ideas which result in new development projects and those which are utilized during problem solving. However, if one classifies the source of an idea as simply 'in-house' or 'external', then a very definite pattern emerges.

---

* In 1969/70 Government in the U.K. funded about 30% of the total expenditure on R & D in private industry. An estimate in the U.S.A. put the Federal Government share in 1973 at 40%. Sources: Studies in Official Stats. No. 21 'R & D Expenditures', HMSO, 1973. 'National Patterns of R & D Resources' NSF. 74-304 Washington, U.S.A.

3.1 *Myers and Marquis*

153 Project initiation ideas	*414 Problem solving ideas*
39% Internal	60% Internal
50% External	29% External
11% Multi-channels	11% Multi-channels

3.2 *Utterback*[8]

Utterback studied the different communication events associated with the initiation and subsequent development of 32 award winning scientific instrument innovations in the U.S.A. The following pattern was observed:

Project stimulating inputs (*Idea generation*)	*Other inputs prior to funding* (*Project definition*)	*Inputs following funding* (*Problem solving*)
Internal 34%	47.8%	64.4%
External 66%	52.2%	35.6%

Unfortunately no comparable data exists from the SAPPHO and Bolton Committee studies concerning the relative percentages of problem solving ideas which arise in-house and those which arise external to the innovating organization. However, both studies show that approximately half of the inputs which lead to the initiation of new projects arise internally and half externally (although the Bolton Committee data suggests that this fraction is a function of firm size). Nevertheless, there is a clear indication from the above two studies (Myers and Marquis and Utterback) that the information seeking behaviour of scientists and technologists depends on the stage of the innovation process at which information is being sought. Since many innovations are stimulated by the recognition of a definite need (evidence suggests that for *successful* innovations the fraction is about three-quarters of the total), and since much of the 'new science' or 'new technology' which stimulates the other innovations will be developed outside any one innovating organization, often within universities and government laboratories, and will therefore generally be well known it is not, perhaps, altogether surprising that the majority of ideas leading to the initiation of new projects originate externally to the innovating organization. Furthermore, since one might expect the search for problem solving information to proceed from easily accessible sources to more difficult ones—through literature and memory, through interaction with colleagues, through experimentation and finally through external search—it is not altogether unexpected that most problem solving information is found in-house.

Myers and Marquis further studied the information *channels* used during idea generation and those employed in problem solving. In idea generation personal contact accounted for 34% of the ideas, 4% inside the firm and 30% external to the firm. During problem solving personal contact accounted for 22% of the ideas, 5% inside the firm and 17% outside the firm. During both the functions R & D and experience accounted for a large proportion of the total (25% and

29% respectively). Literature accounted for only 10% of ideas during idea initiation, all of which were external, and 9% during problem solving, of which 2% were internal and 7% external. It can be seen that channel usage is quite similar in both phases. According to Utterback 15.3% of the project initiating inputs were literature, 44% external discussion and 13.6% analysis and experimentation. In problem solving the percentages for the same channels were 8.4%, 21.7% and 51.8% respectively: clearly some differences in channel usage during the different phases of innovation are indicated in the latter study.

There exists also evidence to suggest that information seeking behaviour (in-house or external) varies according to the seeker's professional discipline, *i.e.* scientist or technologist. For example, Allen[9] studied 17 *development programmes* and discovered that out of 706 messages which resulted in technical ideas considered during the course of the projects, exactly half originated internally and half externally. In a similar study of 2 *research projects* Allen found that 65% of messages originated outside the laboratory and 35% inside. In another study, Gibbons and Johnston[10] investigated the types and sources of information which contributed to the resolution of technical problems encountered during 30 innovations in a variety of industries: one of their major findings was that 'the problem-solver with a university education relied more on information obtained outside the company, from scientific literature and from scientists in universities, whereas problem-solvers with industrial education relied on their own expertise based on education, experience, and industrial contacts to resolve technical problems'. A consequence of this is that '. . problem solvers with industrial education appear to be better at relatively small scale innovation while those with a university education can solve the technical problems arising during a large scale, less standardized innovation more efficiently'.*

Gibbons and Johnston also found differences in the mode of coupling between scientific sources and technological sources: 'the former (scientific sources) were used not at all, or to a considerable extent (limited multiple use) whereas the pattern of use for the latter (technological sources) was distributed much more evenly throughout all the innovations . . .'.†

4 Communication and firm size

It was stated earlier that the percentage of project initiating ideas originating in-house was a function of firm size. The pattern, according to the Bolton Committee data, is shown below:

Firm size (no. of employees)	1–199	200–999	1000+
Percentage of ideas originating in-house	70.55	65.65	48.87

---

* This might go some way towards explaining the figures quoted by Holt[11] who says '. . ideas for the technical solution of minor innovations originate mostly inside, whereas about two-thirds (65%) of basic (major) innovations come from outside'.

† It is interesting to note that Gibbons and Johnston found a somewhat higher contribution from the literature than most other workers: 42% of 'external' information was derived from literature, as was 24% of 'personal' information (*i.e.* information obtained by the innovator prior to the commencement of the project). The aggregate contribution based on all categories of internal and external information was 29%.

On the face of it this appears surprising since larger firms will generally have a greater in-house R & D capacity and might thus be expected to generate relatively more of their own ideas.* However, evidence does suggest that larger firms are more outward looking and have more contacts with external agencies than smaller firms, and Table 1 shows the percentages of firms in the different size categories which contacted Research Associations and/or Technical Associations and/or Management Consultants, etc.

NO. OF EMPLOYEES	0–49	50–999	100+
NO. OF FIRMS	17	29	7
Source of external aid	*% of firms making contact*		
Research Association	30	41	86
Technical Association	48	88	100
Management Consultant	0	17	43
Technical Consultant	6	20	43
Government	60	58	86
Supplier	66	61	71

SOURCE: S. Hyman.[12]

TABLE 1

Further evidence of this firm size effect is provided in a report by the U.K. Universities and Industry Joint Committee[13] (UIJC) who investigated the degree of coupling between university and industry as a function of firm size. On all of the measures of contact considered (sponsor university work, use university consultants, regular contact with universities and use of published information on university work) large firms had by far the greatest number of contacts (average score for firms having between 1–199 employees was 12%; average score for firms having over 5000 employees was 72%). Of 403 firms having less than 200 employees, 75% had no contact with universities whatsoever whereas out of 96 firms with greater than 5000 employees, only 9% had no contact with universities.

A significant result of the UIJC enquiry lies in the fact that a positive correlation was demonstrated between the number of scientists in the senior management of small companies and the number of contacts with universities. However, of the sample of small firms studied, 71% did not recruit graduates: the corresponding proportion for the large firms was only 10%! Furthermore in 1968, small firms employed slightly more than 15% of all qualified scientists and engineers in manufacturing, which is a concentration of 0.7%, only half that of large firms.[14]

Larger firms will generally have sufficient resources to enable them to subscribe to many journals, to send employees to conferences and seminars and to establish comprehensive library and SDI services etc., whereas small firms cannot finance these operations nor do they have time or personnel to spare for them.* Large firms, will, therefore, have many more contacts with external information sources than will small firms which would go some way towards explaining their apparently greater awareness of external developments. However, this is not the whole story, and the answer might also lie to some extent in the different types of person employed by large and small firms. It has been demonstrated that scientists are more outward looking in their information seeking behaviour than technologists and they look more towards primary sources of information, (*e.g.* scientific journals, university laboratories) than do the latter.† This is because scientists, whether they be in university or industry, speak the same language: they understand one another. Technologists, in contrast, tend to be inward looking and to make use of secondary literature such as trade journals and textbooks. Most of them certainly do not understand university science or the arguments of scientists and, indeed, many have little interest in doing so: these are neither within their scope of learning nor their terms of reference in industry. It is not surprising then, when one considers not only the relative levels of resources available to large and small firms, but in addition the type of person employed by them (remember, large firms have double the concentration of QSEs than their smaller counterparts), that large firms interact more with external agencies than do their smaller counterparts.

---

* An F.B.I. survey in 1960 suggested that in the U.K. small firms' share of industrial R & D expenditure was less than 3%: at the same time the share of small firms in employment was about 20%. More recent data from OECD has shown that in most member countries the hundred largest R & D performers accounted for more than three quarters of total industrial R & D expenditure. Sources: FBI, 'Industrial Research in Manufacturing Industry', 1961. OECD: 'The Overall Level and Structures of R & D Effort, in Member Countries, Paris, 1969.

5 'Levels' of information

The question raised above concerning the differences in level of understanding between scientists and technologists is of extreme importance to those whose job it is to satisfy industry's STI requirements. Not only must information be made readily available to those seeking it but it must also be couched in terms which they understand and presented at levels of sophistication which match, but most certainly do not exceed, their own levels of comprehension.

As an example of this consider a firm which requires information concerning the possible use of metalliding‡ in changing the surface properties of a metallic component. The relevant information can be presented at two levels. First, information describing the thermo-dynamics of the system: effect of surface impurities, dislocation densities, temperature of salt bath, etc. on the metal ion transfer and diffusion rates. Second, a simple tabulation or graphical representation of data showing changes in surface hardness and in dimensions of the component as a function of time at different temperatures. The scientist might deduce the second from the first whereas the technologist almost certainly will not. Clearly the technologist's need will only be met when he is presented with the second set of data, which contains relevant information at a level at which he can understand it.

---

* See R. Rothwell and J. Townsend, 'The communication problems of small firms', *R & D Management*, 3, (3), (Notes and Comments), June 1973.

† See Allen, ref. 9; Gibbons and Johnston, ref. 10.

‡ A process whereby the surface properties of a metal are altered by immersion in a bath of molten salts.

6 Conclusions and implications for Management

From the above discussion the following four general conclusions can be drawn:

(a) the information seeking behaviour of innovators tends to very depending on the phase in the innovation process during which information is being sought, from an outward looking attitude at 'idea generation' to introspection during 'problem solving'. (Myers and Marquis,[4] Utterback[8])

(b) The information habits of scientists differ significantly from those of technologists, the former coupling strongly with extra-organizational sources and relying heavily on primary literature, the latter using mainly in-house sources and secondary literature. (Allen,[9] Gibbons and Johnson[10])*

(c) the STI retrieval behaviour of organizations is a function of size, the larger organizations having a greater tendency (and ability) to interact with external agencies than their smaller counterparts.

(d) information must not only be made more easily accessible to the seeker, but it must also be presented to him at a level commensurate with his ability to understand it.

Clearly, these conclusions have profound implications for both information scientists and for those whose task is the management of innovation. Since the majority of information inputs to the idea generation phase of innovation arise externally to the innovating organization, it is essential that the information officer be made aware of the firm's strategies and long term plans for new development. It is only in this way that information officers can present information to R & D management, which is relevant to their future interests and which may, indeed, anticipate their needs. The objectives, the needs and the problems of the organization must be spelt out clearly to the information officer, thus enabling him to construct current and future profiles of its information requirements. The causal role of speedy and efficient information retrieval and dissemination in successful innovation must be recognized and accepted by top management and the information department must be set on a level with R & D, production and marketing. It is only when management appreciates the full importance of the information function that the information department can play its full role in stimulating and assisting innovation and growth.

REFERENCES

1 ROBERTSON, A. B. 'Information flow and industrial innovation', *ASLIB Proceedings*, 25, (4), April 1973, pp. 130–39.
2 ROTHWELL, R. *and* ROBERTSON, A. B. 'The role of communications in technological innovation', *Research Policy*, 2 (1973), pp. 204–25.
3 HOLMES, P. 'The role of information in Science and Technology', OSTI Report No. 5180.
4 MYERS, S. *and* MARVUIS, D. G. 'Successful industrial innovation', N.S.F. 69–17, 1969.
5 ROTHWELL, R. *et al.* 'Sappho updated; Project SAPPHO Phase II', *Research Policy*, 3, (3), 1974, pp. 258–91.

---

* In the case of Allen the differences were observed between scientists performing research and engineers doing development work. The differences observed by Gibbons and Johnson were between graduates and non-graduates. Perhaps a suitable general distinction could best be made between 'qualified research staff' and 'development staff'.

6 FREEMAN, C. *et al.* (1971), 'The role of small firms in innovation in the U.K. since 1945', Committee of Enquiry on Small Firms, Research Report No. 6, H.M.S.O.

7 LANGRISH, J. *et al. Wealth from knowledge,* London, Macmillan, 1971.

8 UTTERBACK, J. M. 'The process of innovation, a study of the origination and development of ideas from new scientific instruments', *IEEE Transactions on Engineering Management,* EM–18, 1971, p. 124.

9 ALLEN, T. J. 'Performance of information channels in the transfer of technology', *Industrial Management Review*, 1966, p. 87.

10 GIBBONS, M. *and* JOHNSTON, R. D. 'The interaction of Science and Technology, Manchester University, Department of Liberal Studies in Science, 1972.

11 HOLT, K. 'Stimulation of creativity—generation of ideas', Proceedings of the 6th International TNO Conference, Netherlands, March 1973.

12 HYMAN, S. *Associations and consultants*, London, Allen and Unwin, 1970.

13 'Industry, Science and the Universities', University and Industry Committee, CBI, July 1970.

14 COX, J. 'Committee of Enquiry on Small Firms', Research Report No. 2, H.M.S.O., 1971.

A guide to Selected British Non-computer-based Commercially-available Information Services

Compiled by

Ruth Finer & Peta L. Bowden
Aslib Information Department

£3.60; £1.80 to Aslib members
SBN 85142 065 6

3 Belgrave Square London SW1X 8PL

Aslib Publications

The availability of standards in the United Kingdom

Part 1: British Standards Institution publications

Angela M. Allott

Sheffield City Libraries, Commerce and
Technology Division

THIS IS THE FIRST of three articles on the various series of standard specifications which are most often referred to by industry and government in the United Kingdom. Information officers, standards engineers and librarians are frequently asked to supply and identify standards. An account is given here of what standards have been issued, where they can be consulted, borrowed or bought. The standards will be dealt with in the following order: British Standards Institution publications; other British non-BSI standards; and finally international and foreign standards.

The last hundred years have seen an astonishing growth in standardization, but the end result is not grand simplicity, neither is it perfect harmony of people, purpose and material. Regretfully, after a century of activity on a world-wide scale, the result is awesome complexity and scarcely controlled chaos. The number of standards issuing bodies continues to increase. Internationally there is a plethora of organizations, nationally there are seventy-nine countries which belong to the International Organization for Standardization (ISO), all issuing their own standards. In the United Kingdom, apart from the British Standards Institution, there are government departments, nationalized industries, trade and research associations and large companies, all preparing their own standards. Some standards have the force of law and are mandatory, others recommendatory. The wide variety of standards in existence affects the manufacturer, the supplier and the consumer. Standards engineers, information officers and librarians need to know what standards exist since they are referred to, and used by the whole of industry. In this article, consideration is given to the publications of the British Standards Institution, the different BSI series and where they can be seen, bought or borrowed.

British Standards Institution

Many people are under the impression that the only standards issuing body in Britain is the British Standards Institution (BSI). This is not so, but it is the foremost national organization. It is an independent body financed jointly by industry and government, but its finances have been under great stress in recent years. From 1975, a new structure is being implemented for the Institution as BSI's supplementary government grant is being phased out, and a sounder subscription-based system is to be introduced. A recent document, 'The next five years: a policy statement on the likely development in the organization and work of

Aslib Proceedings 27 (5), May 1975, pp. 227–237. Printed in Great Britain

BSI' sets out this system, together with other new developments and the thinking behind them. The work of BSI's technical committees will continue but under more rigorous scrutiny. Standards will not be started until the need for them is made clear, and as a result, the rapid expansion of recent years may be checked. A more realistic view will be taken of BSI's international and national commitments.

British Standards. General series: BS

These are the principal publications of BSI. They have a numerical reference which is usually quoted in the form BS plus a number (*e.g.* BS 1305: 1974, Batch type concrete mixers). From 1972 to 1974 all the BS series have been issued as A4 size pamphlets, suitably punched for loose-leaf binders, and coloured grey. As from the 1st January 1975, all General series publications will have white covers. Before 1972, the General series came in various shapes and sizes (*e.g.* quarto, looseleaf, octavo) but in uniform grey covers. Until 1974, the BS General series began with number 1 (one), but since then a new series of standards has been introduced, BS 0 (nought), (*e.g.* BS 0: 1974, A standard for standards (in 4 parts); BS 0: Part 4: 1974, Guide to BSI editorial practice). One can only hope that the principles behind BS 0: 1974 will be applied across the board for all BSI publications. However, even BS 0 perpetuates some of the differences in procedure, publication format and updating methods which already cause confusion in the existing standards.

The complexity of formulating and preparing for publication any standard is shown, for example, by BS 4360: 1972, Specification for weldable steel structures. In this standard, more than 20 organizations were directly concerned with its preparation, and at least 40 more were consulted during the drafting. Such wide-ranging involvement necessarily slows down the whole process of standardization. Reconciling the need for overall agreement with the economics of standardization is at the heart of the standards issuing bodies' financial problems. BSI's technical committees have done fine work over the years, on a strictly voluntary basis, BSI's Park Street secretariat co-ordinating all their activities. By 1974, more than 500 new or revised standards were being prepared each year, and more than 6000 were currently available.

All the BS General series are listed in a single sequence of current, withdrawn and superseded standards in *BSI's Yearbook*. This list is supplemented by information in BSI's newly established *Sales Bulletin*, which is issued 6 times a year. The *Bulletin* is cumulative and lists new standards, new editions (although it does not indicate the date of the earlier editions being superseded), amendments, etc., and has the same arrangement as the *Yearbook*. BSI's glossy monthly journal, *BSI News* gives fuller details of the new standards and fills in the background on BSI's international activities. *BSI News* is now a lively, readable publication, with the beginnings of 'feedback' from standards users through its letter and comment columns. The Institution's *Worldwide list of published standards* (monthly) lists the standards of foreign countries together with new British Standards in its classified UDC sections.

In addition to the BS General series, other standards series are issued by BSI, all of which are identifiable from their prefixes. These series are as follows.

BS Codes of practice: CP

Although CPs are issued mainly for the construction and engineering industries, they cover a wide range of topics. Like the BS General series, they have recently changed their format. Previously they were A5 in size, and coloured red, yellow or green. Now they are A4 size, and a uniform green colour. BSI's CPs were originally issued by the Civil Engineering Joint Committee of the professional engineering institutions. The usual mode of reference is CP plus a number (*e.g.* CP 98 1964, Preservative treatments for constructional timbers). Where there is more than one part published for a CP, this was formerly shown by a unique reference number (*e.g.* CP 327.102: 1952, Telephones and telegrams. Private services). This sub-series number was found confusing sometimes, and was even thought to be a classification number on the lines of UDC! The later form of reference for a CP in more than one part is now in the conventional manner (*e.g.* CP 2012: Part 1: 1974, Foundations for reciprocating machines). There are more than 150 Codes of practice already published.

A further change is planned for CPs from December 1974. CPs are to cease as a separate BSI series and will be incorporated into the General series. Until 1976, however, both the present CP references and the new BS General series numbers will be used to help in identification. CPs will still be listed as a separate series in *BSI Yearbook*, in the *Sales Bulletin*, and in *BSI News*. As new CPs are issued they will have a BS General series four figure number, (*e.g.* BS 0). Further information on this significant change in the CP series is given in *BSI News*, November 1974, page 5.

BS Automobile series: AU

This series used to be issued by the Society of Motor Manufacturers and Traders and was known by their initials (SMMT). However, all the standards now being issued are being given the prefix AU. The usual form of reference is AU plus a number (*e.g.* AU 157: 1973, Children's restraining devices). So far there are 161 AU standards. Unlike the BS General series, new editions of AU standards are indicated by the addition of a lower-case letter after the AU serial number (*e.g.* AU 159a: 1973, Repairs to tyres for motor vehicles). AU standards are also listed in *BSI Yearbook*, *BSI Sales Bulletin*, and in *BSI News*. AU standards are published in data sheet format, in A4 size, on yellow or white paper. Though it is some time since they became AU standards, it is not uncommon for them to be asked for under the prefix SMMT, even for recent publications.

BS Marine series: MA

BSI's Marine series is issued on A4 size green paper in data sheet format. The usual form of reference is MA plus a number (*e.g.* MA 8: 1970, Small (weathertight) hatches). There are now some 52 standards in the MA series. They are listed in *BSI Yearbook*, *BSI Sales Bulletin* and in *BSI News*.

BS Aerospace series, A, B, C, etc.

These specifications were originally called aircraft specifications. They are issued in classified order, using alphabetical prefixes. Not all the letters of the alphabet are used, E, I, O, R, U, Y, Z are omitted. It is sometimes possible to see a mnemonic significance between the prefix and the subject (*e.g.* F for Fabrics, S for Steel) but there is no automatic correspondence between the material and the prefix (*e.g.* A for Bolts, G for Electrical equipment–indicating systems). These publications are issued in data sheet format, in A4 size, but this time on blue paper, either single sheets or several stapled ones. Like the other standards issued in data sheet form (AU and MA series) Aerospace standards do not have separate covers or title pages. The mode of reference is by letter(s) plus a number (*e.g.* M 21: 1947, Kaolin for aircraft purposes). To indicate a new edition, a figure is inserted before the alphabetical prefix (*e.g.* 3 M 23: 1968, An identification scheme for pipelines). This method is peculiar to Aerospace specifications in BSI publications, and it can lead to misunderstanding in filing (where it is sometimes taken for a totally different series of standards, *i.e.* numerical not alphabetical arrangement). They can also be confused with metal quality grade marks within British or foreign standards. If BSI could standardize its own methods of indicating new editions, it would be a useful step towards consistency, and ease problems of identification (*e.g.* enquirers confuse a reference to Aerospace specification prefix S (quoted verbally as BS S) with the old style mode of referring to British Standards General series, *i.e.* BSS, for British Standard Specification.

Aerospace specifications are listed in *BSI Yearbook*, directly after the BS General series. They are given in two sequences, one for current specification, the other for withdrawn or superseded ones. Aerospace specifications are listed in *BSI Sales Bulletin* and in *BSI News*.

BS Drafts for development: DD

Drafts for development were first produced in 1971. Quixotically, the Second Draft for development (DD2: 1971, Dynamic force calibration of axial load) was the first one to be published. DD 1: Part 1: 1969, Accuracy in building imperial units, was retrospectively so designated and it is still listed in *BSI Yearbook* as PD 6440: Part 1: 1969, with a reference to DD 1. DDs are not to be considered as definitive BSI standards. Each of the 40 DDs already published contains a disclaimer from standards status. They are intended to give guidance and to be possible bases for future standards. In this they differ somewhat from the many tentative, experimental or draft standards brought out by other standards issuing bodies, where the preliminary standard has, in effect, the status of a standard from its very first publication. Maybe, to echo Eliot's classic 'Notes towards the definition of culture', DDs are BSI's 'Notes towards the definition of a standard'. DDs are issued in A4 size, with covers and title pages, coloured bright tangerine orange. They are listed in *BSI Sales Bulletin*, in *BSI News* as well as in *BSI Yearbook* where they occur after the PD sequence.

BS Published documents: PD

PDs are a series of miscellaneous publications. They come in various shapes and sizes, in patterned and plain covers. Like the BS General series, they have title pages and covers and are in pamphlet form. Their range of topics is unexpectedly wide (*e.g.* PD 52373: 1964, How to look after a piano; PD 3542: 1970, The operation of a company standards department). In the past, BSI have also used the prefix PD to identify amendments to the BS General series (*e.g.* PD 5991, Amendment to BS 3456: section A 12: 1962). This dual use of PD has often led to misunderstandings. PDs which are separate publications in their own right are listed in *BSI Yearbook* as a special entry, whereas PDs used to identify amendments to BS General series are only listed in *BSI Yearbook* under the BS standards they amend. If one knows a PD number but is uncertain to which standard it is an amendment, there is no master list of PDs in numerical order which could lead one to the original BS standard. However, this source of confusion is growing less as PD is no longer used for amendments, BSI now giving the prefix AMD plus a number (*e.g.* AMD 1062: Amendment to BS 3989: 1966, Aluminium street lighting columns). There is no master list of AMD numbers given in the *BSI Yearbook*. New AMDs are listed in the *BSI Sales Bulletin* and in *BSI News*.

BS STA series

The STA series of specifications was originally issued by BSI on behalf of the war-time Ministry of Supply. Today, BSI has responsibility for the few remaining standards in the series (*viz* STA 13, STA 17, STA 19, STA 23) which have not been transferred to the Ministry of Defence nor incorporated in other BS General series standards (*e.g.* STA 3 was superseded by BS 1408: 1964; STA 1 to STA 5 were superseded by S.D.M. (L) 127 Ministry of Defence Army Department). In *BSI Yearbook*, the STA series is listed after the DDs. Only those STA standards which are still BSI's responsibility are itemized. The earlier STAs were issued in A4 size in data sheet format on white paper. Later standards tend to be in duplicated form in the same size. Sixty-five STA standards have been issued at one time or another.

BS European standards: EN

EN standards are the British series which are required to be published when the CEN (European Committee for Standardization) standards have been accepted by the United Kingdom. It is obligatory for the agreeing nations to issue them without change, as their own national standards. There are three official versions, in German, French and English. National versions in any other languages (*e.g.* Dutch, Italian,) rank as translations, the authenticity of which has to be checked against the three recognized equivalent versions. The first ENs to be issued by BSI were treated as a separately published series (*e.g.* BS EN 2 1972, Classification of fires, which is identical to BS 4547). In future, one is given to understand, EN standards will be issued as part of the ordinary BS General series with an indication that they are the British versions of CEN standards (*e.g.* BS 5219: 1974, Dimensions of bed blankets, which is identical to EN 14, includes the EN 14 number on the front cover). Whenever a British Standard is a repetition of an international publication *without deviation*, it will carry the international number on the cover. This means that no extra series of publications needs to be issued. Their format is the same as the BS General series. They are listed in *BSI Yearbook, BSI Sales Bulletin*, and in *BSI News*.

BS Public authority standards series: PAS

Public Authority Standards are published by BSI on behalf of the Public Sector

Standardization Team. This comprises government departments, nationalized industries, local authorities and other public bodies, such as the National Bus Company, British Gas Corporation, etc. PAS standards do not have the status of British standards but they may be considered suitable for conversion into British Standards by due process at a later date. They are usually referred to in the manner PAS plus a number (*e.g.* PAS 17: 1974, Specification for sheeting, sheets and pillow slips). They are issued in A4 size, in pamphlet form, punched for loose-leaf binders, with covers and title pages. They are pale green in colour. PAS standards seem a sensible way for the rapidly growing public sector to rationalize its multifarious standards through orderly co-operation and co-ordination (*e.g.* PAS 17: 1974 supersedes DEF 1063 and DEF 1065).

BS/MOE standards series

This special series of British standards was prepared for the Ministry of Education (now the Department of Education and Science) in collaboration with the Ministry of Works (now the Department of the Environment) and the Scottish Education Department. 22 BS/MOE standards were published. At present, only BS/MOE 11-22 are still listed by BSI in their *Yearbook*. These are contained in a single volume, A4 in size, grey coloured in the same format as the BS General series.

BSI Technical Help to Exporters: Hemel Hempstead Centre (THE)

This swiftly developing service is run from BSI's Hemel Hempstead Centre where 'Kitemarking' and testing of products is also done. THE both prepares relevant publications for sale and loan, and also makes available technical expertise on practical matters to industry. It is BSI's export-orientated standards information branch. In general, THE markets information on a consultative-basis, or through its subscription service. It is rapidly collecting a valuable data bank of information on every kind of standard, code of practice, technical and legal requirement which could affect an exporter's product. It is not concerned with British domestic standards except where they are identical to, or compatible with foreign needs. It has produced extensive translations of key foreign standards documents and has also started to act as a bulk supplier of foreign standards publications which have previously been hard to obtain. BSI Sales Department handles orders for foreign national standards, mentioned in *Worldwide list of published standards*, but there is a demand for other standards publications, particularly those produced by the many U.S. standards producing bodies. THE's financial independence is based on a continuing expansion of its services.

Increasingly THE's information service on foreign requirements, including standards, is being relied upon by firms throughout the United Kingdom. Whereas BSI's Park Street library generally collects foreign standards on a reciprocal basis from other national standards issuing bodies parallel to BSI, THE acquires every kind of standard and specification from both official and semi-official standards and regulatory bodies. Further information on THE is available from their headquarters, THE, Maylands Avenue, Hemel Hempstead, Herts., HP2 4SQ.

BSI publications: availability and supply

All the BSI standards and publications mentioned in this article are available for sale from BSI Sales Branch at 101 Pentonville Road, London N1 9ND, over the counter at 2 Park Street, London W1A 2BS, at the Branch Office at 115 Portland Street, Manchester M1 6EB and also from the Chambers of Commerce in Birmingham, Bristol, Glasgow and Liverpool. In addition, certain organizations (*e.g.* the Building Centre in London) keep a supply of relevant BSI publications for their customers. Firms and other organizations prepared to become subscribing members of BSI obtain BSI publications at special concessionary prices. Although most customers deal directly with BSI, it is possible to buy the publications through booksellers. Recently there has been some disquiet about the supply of standards and BSI is very conscious of the delays experienced by its customers and is making every effort to overcome them. Deteriorating postal services have not aided the situation. Standards are always needed urgently and standards engineers and librarians have often been blamed for non-availability of standards when the blame should have been laid upon the distribution system of the standards issuing bodies. Delays, increased costs and rising prices of standards publications have formed a vicious inflationary spiral which causes the falling off of sales, which in turn cause prices to rise, etc. The temptation to rely on photocopying (both legal and illegal) is very strong. In the United States, the American Society for Testing and Materials (ASTM) has suffered from this syndrome. It is to be hoped that BSI will manage to break out of the trap and improve its economic viability and its supply of standards. The ideal would be a by-return service of standards supply.

Reference and loan copies of BSI publications

All the BSI publications listed in the course of this article, together with foreign national standards, are available for consultation in BSI's own library in Park Street, London. Foreign standards are loaned to subscribing members of BSI but British Standards are never loaned. A recent useful article on BSI library and its services appeared in *BSI News*, November 1974, pp. 16–17. In addition, *BSI Yearbook* lists the various reference collections of BSI standards in public libraries throughout the country. Most libraries named in the list are local authority reference libraries, but included also are libraries in polytechnics, colleges of technology or certain further education college libraries. The loans policy of these library collections varies from one library to another.

The library service on standards offered to the public is of varying quality. From the users/readers point of view, the easiest collections to consult are those where the BSI publications are kept together as a unit, and are readily available for consultation. A well-informed staff, interested in standards provision, can be of great assistance both to the casual enquirer and to the regular standards user. The fact that standards have amalgamated or been withdrawn should be passed on to the user as soon as possible. Updating of standards through amendments is a tedious, though necessary, task. A senior member of the library staff should take an active interest in the day-to-day functioning of the standards collection, supervising the overall understanding of problems of standards publications, together with the in-service training of junior staff. Where the BSI publications are held in a library, but not specially treated, there is the danger that unfamiliarity on the part of the staff, coupled with the barrier of BSI standards, etc., being 'buried' in the general library stock, can cause them to lie unappreciated by both readers and librarians. As BSI publications are always in a state of change, either by amendment, revision or the introduction of new series, a keen awareness of the standards scene is essential for those having charge of a standards collection. Short courses on the literature of standardization have been arranged by various bodies, *e.g.* SINTO (Sheffield Interchange Organization), SASLIC (Surrey and Sussex Libraries in Co-operation). There is scope for a greater participation of librarians and information officers in such courses. Standards engineers are fortunate in having the BSI Standards Associates section to help them in this respect although not all the regional branches of the Associates are equally active. Where the libraries with standards collections are well organized, there is always the likelihood that knowledge of other standards collections in the same area will supplement and complement their own resources. In any given area, the public library, the polytechnic or technical college library, the engineering department of the local university and industrial firms' standards departments will all have copies of most BSI publications. Through local co-operative schemes, such as LADSIRLAC, SINTO, NANTIS, or the Birmingham and Manchester local networks, availability of loan and duplicate copies of BSI standards will be known to librarians and standards engineers. It may well be that a meeting of representatives of all these standards-holding organizations and libraries could be organized, where the problems and mutual assistance possibilities could be discussed. The British Library Lending Division at Wetherby, Yorkshire, has copies of all BSI publications.

Problems

Obsolete standards

The question of obsolete and superseded standards is a significant one. Where a current collection is maintained, it cannot be stressed too strongly that withdrawn standards should not be destroyed as they are of continuing interest. The major public reference libraries (Manchester, Birmingham, Liverpool, Sheffield, etc.) keep files of withdrawn standards which can be consulted, or even in special instances, borrowed. Repairers, insurers, testing engineers, for example, need these superseded standards to carry out their jobs, whereas reclamation firms and scrap dealers need them to establish what material they are buying. BSI Sales Branch offers only the latest editions for sale. BSI Library has a complete set of obsolete standards for consultation, from which photocopies are sold. The sets of superseded standards in the regional reference libraries are important (and possibly unique) information 'banks'. Perhaps this facility could be indicated in *BSI Yearbook* by asterisking the relevant libraries in the list of libraries holding BSI publications.

Supply

The supply of BSI publications, as has been indicated earlier in this paper, is not as smooth nor as certain as could be wished. Libraries and organizations with 'blanket' orders seem well satisfied with BSI service but those persons who have to order items in penny numbers sometimes find they have to wait for their orders. BSI's troubles–staff shortages and changes, printing delays, ever expanding commitments with ever-increasing costs, the phasing out of the supplementary government grant, etc. – all these affect the supply of standards to customers. Standards often take years to pass through all the prescribed procedures. Company personnel who have participated in the preparation of a standard often know of its existence long before it is ready for publication. Such specialists cannot believe librarians or information officers who report 'Not yet available', 'Not yet printed', 'Not yet received' for items such as these. If a sale-by-return service is not yet possible, then a standards loan-by-return service should be feasible. BSI's library is an admirable service, but it is not BSI policy to lend BS publications – their task is to sell them. BLLD are at present looking into the whole question of standards loan provision. Ironically, a really first-rate loans-by-return service would cause BSI's sales to fall, thus setting off another twist in the inflationary price spiral. But sales would surely pick up again when the need for file copies was appreciated. A greater danger is wholesale copying. Perhaps the new Committee enquiring into Copyright will come up with a sensible alternative—the licensed facsimile transmission of standards in data sheet format possibly from a BSI master copy.

Although BSI in general pursue a uniform approach to the supply of standards to deposit libraries, they have introduced a significant variation. The BS 9000 series* of standards is no longer included in the blanket orders for BSI publications. This series has to be specially requested from the BSI Hemel Hempstead centre. The reason for limiting distribution is the fact that the BS 9000 series is of restricted interest (it deals with general requirements for electronic components of assessed quality) and therefore only concerns a handful of manufacturers. There must, one feels, be other instances of subjects of equally restricted appeal. The introduction of such a restriction of supply seems to alter the principle of complete collections being available to the public in the depository libraries. It could be argued (if restricted appeal is taken as a basis of distribution) that there must be many other instances of equally limited subject interest.

Format

BSI has always rightly prided itself on the quality of its publications, which outshine those of most other national standards issuing bodies, but, as has been mentioned earlier, economic circumstances are forcing it to consider ways of saving money. A first step in this direction was the recent introduction of plain white covers for the traditional grey ones on the BS General series. Now may be the right time for BSI to consider less expensive forms of publication. If, for example, the final typed draft copy of a standard were circulated in duplicated form, it would most probably be acceptable to most users, especially if it meant a quicker and cheaper supply of standards. Those standards with an assured and mass appeal (*e.g.* BS 308: 1972, Engineering drawing practice) could still be published in more durable form. Where suitable, standards could be issued in data sheet format (without separate covers and title pages) which would result in further economies.

---

* Standards in the BS 9000 series are now being issued as harmonized specifications within the CECC system (CENELEC Electronic Components Committee in Europe). In future, those BS 9000 series which are harmonized will have a prefix E before the number (*e.g.* BS E 9110: 1974, with a reference to CECC 40000). For a time, both harmonized and non-harmonized standards will co-exist but eventually, only BS E 9000 series will be prepared.

Identifications, editions, amendments, grade marks, etc.

BSI issues its useful *Worldwide list of published standards* with a helpful table of prefixes to identify the foreign standards. It would be equally helpful if BSI were to issue a similar list for the ordinary domestic BSI standards. At present, the prefixes for the various series are incorporated in the *BSI Yearbook* index, but only under the relevant subject heading (*e.g.* Fabrics, aircraft see Aerospace F series). There is no direct entry in the index under the series prefix letter (*e.g.* F series).

New editions of British standards are not indicated in a single consistent manner. Mention has already been made of the difficulties encountered with the Aerospace system of new edition reference (*e.g.* inserting a number before the series prefix). AU standards also have their own system, AU number plus a lower-case letter (*e.g.* AU 159a: 1973, Repairs to tyres for motor vehicles). The BS General series alters the year of the standard (*e.g.* BS 970: 1972) as each new edition is published but it does not show, at a glance, that it is a new edition (*e.g.* it is mentioned on an inside page of the standard that there were earlier editions). Metric versions of BS General series standards are indicated in *BSI Yearbook* by a capital 'M'; the metric standard when published used to have 'metric edition' overprinted on the cover. As it is now assumed that all standards are metric, this practice has been dropped. However, when a metric edition of the Aerospace standard 7 F 16: 1966, Heavy duty braided rubber cord, was issued in 1973, it was published with a new number F 70: 1973, Heavy duty braided rubber cord, rather than as a new edition of F 16, with a note about the earlier, non-metric version. As far as one can tell, the recent BS 0: 1974, A standard for standards, perpetuates the differences in practice between BS General series and the AU, MA and Aerospace series in relation to indicating new editions. It is to be hoped that a uniform system indicating new editions is recommended for all future BSI publications.

Subject indexing of standards in *BSI Yearbook* index is not always easy to use—it seems to have just growed, like Topsy. At present each British standard is given a UDC class number and it is used when the standards are listed, in UDC order, in BSI's *Worldwide list of published standards*. UDC order is used by many national standards bodies in their catalogues. A keyword index of subjects, allied to a UDC arrangement of the standards would make the *BSI Yearbook* much easier to use when the enquirer needs to know 'what standards have been issued on such and such a subject'. A straight series listing could also be provided. At present BSI issue sectional lists (SL) of standards on broad topics (*e.g.* Building, Documentation) in leaflet form. These are helpful but they are easily lost or mislaid. In addition, not all these subject lists are revised every year.

Grade marks and quality marks within British standards are not yet indexed separately in *BSI Yearbook*, nor are they included in special publications equivalent, for example, to the German *Normenheft series*. In the metals standards in particular, these grade marks are difficult to trace without suitable indexes. Helpfully, BSI Associates recently prepared a list of grades within BS 970 relating to steel qualities. Contrarily, about the same time, BSI withdrew its PD 6290: 1967, New designation system for stainless steels; PD 6423: 1968, New designation system for carbon steels, and PD 6431: 1969, New designation system for alloy steels, on the grounds that now that BS 970 was complete, the PDs were no longer necessary. But the need is still there, since the information in the Associates publication is virtually identical to that given in the former PDs.

To sum up the BSI standards publications situation, it would seem that BSI is a very busy organization which is widely recognized as the most important standards body in the United Kingdom. Its reputation is high. It does not have any difficulty in finding subjects on which to issue standards and it is being more and more involved in national, regional (*i.e.* European) and international standards preparation. There are some difficulties in the supply of standards but these are being overcome. Copies of BSI standards are available for consultation in BSI's own excellent library. Loan copies are held at the British Library Lending Division, and copies for reference are available in more than 230 libraries throughout the country. Within industry there are many well-organized standards collections, which include BSI publications.

BSI standards fulfil a major part of the needs of British users, there are, however, many other important standards issuing bodies within the United Kingdom whose publications are less easy to identify and obtain than those of BSI. Many foreign and international standards are needed by industry but are even less readily available than the British publications. These latter areas of standards provision will be described in a later article.

Choose your carpets with confidence

from DODSON BULL

UP TO 30% DISCOUNT

ALL LEADING BRANDS

Wilton ● Axminster ● Oriental ● Tufted

• All makes available with full Manufacturers' Guarantees
• Free delivery in U K. • Expert fitting service available

£200,000 carpets on display

in our extensive London and provincial showrooms

Free brochure on request to Dept. ALB

DODSON-BULL CARPET CO. LTD.

LONDON: 5 & 6, Old Bailey, EC4M 7JD. Tel: 01-248 7971
BIRMINGHAM: 164, Edmund St., B3 2HB. Tel: (021) 236 5862
BOURNEMOUTH: 268, Old Christchurch Rd., BH1 1PH. Tel: 21248
BRIGHTON: 2-5, North Road, BN1 1YA. Tel: 66402
BRISTOL 2-3 Royal London Hse, Queen Charlotte St. BS1 4EX. Tel: 28857
EXETER: 137, Fore St., EX4 3AT. Tel: 32019
GLASGOW: 156, Howard St., G1 4HA. Tel: (041) 221 3278
LEEDS: 12, Great George St., LS1 3DW. Tel: 41451
MANCHESTER: 55-61, Lever St., M1 1DE. Tel: (061) 236 3887/8/9
NEWCASTLE-upon-TYNE: 90-92, Pilgrim St., NE1 6SG. Tel: 20321/21428
WESTCLIFF-on-SEA: 495, London Rd., SS0 9LG. Tel: Southend 46569
Open: 9.00-5.30 Mon.-Fri., Sat. 9.00-12.00 (Manchester 9.00-4.00)

British Technology Index

CURRENT SUBJECT GUIDE TO BRITISH TECHNICAL JOURNALS

FOR TRACING AND RECALL

of { specific / recent } information

in the Field of Applied Science, Engineering and Manufacturing Technology

Monthly Parts and Annual Volume

THE LIBRARY ASSOCIATION

7 Ridgmount St. Store St. London, WC1 7AE
(Phone: 01-636 7543)

AT LAST:

A social sciences reference tool that's easy to use, highly current, and multidisciplinary too!

It's a lot easier to search the social sciences journal literature when your library has the *Social Sciences Citation Index™* (*SSCI™*).

The index that offers an integrated search system designed to overcome the ambiguous terminology and wide scatter of related articles that used to make social science searches so difficult. The *SSCI* takes advantage of two powerful retrieval methods: Citation Indexing—which utilizes the fact that an article's reference citations to earlier publications are excellent indicators of the subject of the article, and Permuterm® Indexing—a natural language system that pairs every significant word in an article's title with every other word in that title to produce extremely specific, two-level indexing entries.

With *SSCI,* all you need to start a search on any subject is the name of a key author in the field of interest or any English word that is descriptive of the subject. There's no need to master specialized search vocabularies or complex classification schemes.

With *SSCI* you don't have to use a half-dozen discipline-oriented indexes to assure comprehensive searches. A single look-up lets you search the entire output of over 1,000 journals from all the fields relevant to the social sciences including anthropology, community health, demography, economics, educational research, ethnic group studies, geography, history, law, linguistics, management, marketing, political science, psychiatry, psychology, sociology, statistics, and urban planning and development.

And because *SSCI* is computer-produced, it's the most current index of it's size—the one you find new articles in while they're still new.

Send the coupon for more information.

SOCIAL SCIENCES CITATION INDEX™ isi
SOCIAL SCIENCES CITATION INDEX™ isi
SOCIAL SCIENCES CITATION INDEX™ isi
SOCIAL SCIENCES CITATION INDEX™ isi

13-335a

Please send me more information on your new

SOCIAL SCIENCES CITATION INDEX™.

NAME__________
POSITION__________
LIBRARY__________
ADDRESS__________
CITY______ STATE______ ZIP______

isi® **Institute for Scientific Information**
325 Chestnut Street, Philadelphia, Pa. 19106, USA
Tel: (215) 923-3300 Cable: SCINFO, Telex: 84-5305

©1975 ISI

Recently Published Reference Books From Gale

Subject Directory of Special Libraries and Information Centers.
1st ed. Edited by Margaret L. Young, Harold C. Young, and Anthony T. Kruzas. A brand-new *subject* arrangement of all 13,078 entries in the *Directory of Special Libraries.* Five volumes: *Business and Law, Education and Information Science, Health Sciences, Social Sciences and Humanities,* and *Science and Technology.* 1,287pp. $90.00/set. $25.00/vol.

Ray Bradbury Companion:
A Life and Career History, Photolog, and Comprehensive Checklist of Writings. With Facsimiles from Ray Bradbury's Unpublished and Uncollected Work in All Media. Edited by William F. Nolan. 130 Illustrations. Index. Slipcased. A Bruccoli Clark Book. 339pp. $28.50.

Awards, Honors and Prizes:
A Source Book and Directory. 3rd ed. Edited by Paul Wasserman. Now in two volumes. Vol. 1, *United States and Canada,* is a major revision of the previous edition. Vol. 2, *International and Foreign,* provides for the first time facts about awards outside North America. Index of Awards. Subject Index of Awards. Vol. 1, $38.00. Vol. 2, $48.00.

Library Bibliographies and Indexes:
A Subject Guide to Bibliographies, Indexes, and Other Resource Lists Available from Libraries, Information Centers, Library Schools, and Professional Associations of Librarians in the U.S. and Canada. Edited by Paul Wasserman and Esther Herman. 301pp. $58.00.

Guide To Theses and Dissertations:
An Annotated International Bibliography of Bibliographies. Edited by Michael M. Reynolds. Identifies and annotates over 2,000 bibliographies. Institutional Index. Author, Compiler, and Editor Index. Subject Index. 614pp. $45.00.

First Volumes in the Gale Information Guide Library

American Fiction, 1900-1950:
A Guide to Information Sources. Edited by James Woodress. (Vol. 1 in the American Literature, English Literature, and World Literatures in English Information Guide Series, a part of the Gale Information Guide Library.) Annotations. Index. 260pp. $18.00.

English Prose, Prose Fiction, and Criticism to 1660:
A Guide to Information Sources. Edited by S. K. Heninger, Jr. (Vol. 2 in the American Literature, English Literature, and World Literatures in English Information Guide Series, a part of the Gale Information Guide Library.) Annotations. Index. 255pp. $18.00.

American Painting: A Guide to Information Sources.
Edited by Sydney Starr Keaveney. (Volume 1 in the Art and Architecture Information Guide Series, a part of the Gale Information Guide Library.) Annotations. Index. 260pp. $18.00.

Latest Additions To Gale's Concordance Series

A Concordance to F. Scott Fitzgerald's The Great Gatsby.
Compiled by Andrew T. Crosland. Based on the 1925 first-printing text, emended by Prof. Matthew J. Bruccoli in his *Apparatus for a Definitive Edition of The Great Gatsby.* Includes a table keying page references in the Student's Edition to those in the first Scribner printing. Word Frequency Tables. A Bruccoli Clark Book. xviii + 425pp. $35.00.

A Concordance To the Poetry of Langston Hughes.
Compiled by Peter Mandelik and Stanley Schatt. Covers all of Hughes' poetry; based on the most recent of the poet's numerous revisions. Word Frequency Lists. 295pp. $40.00.

A Concordance To the Complete Poetry of Stephen Crane.
Compiled by Andrew T. Crosland. Based on the text of Stephen Crane's *Poems* edited by Prof. Fredson Bowers. Word Frequency Tables. A Bruccoli Clark Book. 189pp. $40.00.

WRITE FOR GALE'S COMPLETE DESCRIPTIVE CATALOG

All Gale books are sent
on free 30-day approval.

GALE RESEARCH CO.

Book Tower
Detroit, Mich. 48226

Published in England by Aslib, 3 Belgrave Square, London SW1X 8PL
Printed at the Alden Press, Oxford

SASI AUG 7

Aslib

Proceeding

Looking backwards and forwards *D. J. Urquhart*

Library-based information services in higher education: towards a reappraisal *Gerry M. Smith*

A manual current awareness service at the University of Aston *Ida Vincent and John H. Seals*

A list of resource material in Social Welfare *Aslib Social Sciences Group*

Technical Note
Time-Factor classification *R. Moss*

Letter
The currency of COMPENDEX *B. C. Brookes and A. Presanis*

CALCUTTA UNIVERSITY
CENTRAL LIBRARY

JUNE 1975
VOL. 27, NO. 6

A unique service to keep you up-to-date on consumer affairs

The Daily Consumer News Sheet

Thousands of words are printed every week on consumer affairs covering consumer protection, consumer demands, consumer goods and services, and consumer complaints. They appear in books and magazines published by consumer organizations, in reports and regulations issued by Government departments and in regular consumer features in newspapers.

All this material is bought, scanned and abstracted by the Consumers' Association Library. It is a very expensive operation.

How can this help you?

For just £100 a year subscription you could receive all this information in digest form. Each working day the library produces the *DAILY CONSUMER NEWS SHEET* which will be mailed to you by first class post five times a week.

If you would like to see sample issues and receive a subscription order form please write to:

The Chief Librarian Dept CN1 Consumers' Association
14 Buckingham Street London WC2N 6DS

Aslib Proceedings

VOLUME 27 JUNE 1975 NUMBER 6

© 1975 Aslib and contributors

Aslib Proceedings *is published monthly and supplied free to members of Aslib. Subscription rates are £18.00 annually to non-members, or £9.00 to Aslib members requiring additional copies. Single copies £1.70, or 85p to members.*

Further information about Aslib's services and membership rates will be supplied on application to the Director, Aslib, 3 Belgrave Square, London SW1X 8PL. Tel: 01-235 5050. Telex 23667; answer-back, Aslib London.

Notes for contributors

Aslib Proceedings now accepts contributed papers in addition to those presented at Aslib meetings and conferences. They should be of a practical nature and of some relevance to problems encountered in the everyday operation of library and information units, or services. Other kinds of contribution which will be considered for inclusion are short notes on new information units or special libraries; the introduction of new techniques or systems in existing libraries where these may be of general interest; equipment designed by members for special purposes and put into operation in their own organizations; and objective reports on experience with new 'packaged' commercially available information services.

Contributions, which should be typewritten, double spaced, single-sided on A4 paper, and not more than 3,000 words in length, should be addressed to the Editor, *Aslib Proceedings*, 3 Belgrave Square, London SW1X 8PL. If possible, authors should include a summary of up to 200 words with the typescript. Authors will receive twenty-five offprints of their article free of charge.

Looking backwards and forwards

D. J. Urquhart

Visiting Professor, Loughborough University of Technology

Paper presented at an Aslib Evening Meeting, 15th January 1975

I DO NOT KNOW how many lectures and papers I have produced during my career. Most of them follow the same pattern. Somebody invites me to speak. In a weak moment I accept with but a vague idea about what I will say. As the critical day approaches the subject of my talk becomes even vaguer to me, and then suddenly I become desperate and put something down on paper.

There have been, however, a few occasions when some ideas demanded an outlet. Looking backwards, these are the few occasions which stand out in my mind, so tonight I propose to refer to two of them.

The first arose in 1947 when I was responsible for the Science Museum Library's loan service. All sorts of criticisms of this service reached me, so I decided to try and discover some facts. To quote the first paragraph of the paper:[1]

> A great deal of discussion is proceeding with regard to the distribution and use of scientific and technical information, and theories and proposals on the subject fill the air, but the facts on which these discussions are based appear to be few, or even non-existent. This paper is the report of an effort to discover, by means of a questionnaire addressed to the readers of publications borrowed from the Science Museum Library, some information on such questions as how references to publications are obtained, what the expected information is required for, and whether, in fact, the publications contain the desired information. No earlier survey of this type has been traced.

By present-day standards there was nothing remarkable about the technique used or the results. The importance of the paper was that it was one of the first inspired by the idea that scientific methods could be used to determine users' needs.

J. D. Bernal thought this paper was so important that he insisted that it should be reprinted as one of the papers for the Royal Society Scientific Information Conference.[2] At that conference there was a discussion on information research. What I remember most about that discussion was that many FRS's did not think that investigations to determine the needs of scientists were quite proper. This produced from me what, considering the context, must have been the cheekiest observation of my career: 'We must collect facts, analyse facts and act on facts and ignore opinions.'

Since 1948 the volume of research into information matters has increased considerably. This has been due to a variety of causes. The expansion of academic institutions has resulted in an increase of research in all fields. There

Aslib Proceedings, 27 (6), June 1975, p. 230–38. Printed in Great Britain

has been a considerable increase in academic library schools and funds for research activities have become more readily available from OSTI (now British Library, Research and Development Department). But looking around it seems that the quality of much of this activity is so poor that it has contributed little to the development of a useful understanding of library and information problems. One reason for this is that the term 'research', because of its prestige in the scientific field, is used in other fields for what used to be called 'study'. Another reason is that the expansion of social sciences activity has led to some confusion of thought as to what constitutes scientific research in the library and information field, or indeed in any field. I have contemplated trying to write a treatise on this subject. Tonight I have only time to outline what I think this treatise should contain.

First, any research in the library and information field must be applied research—we just do not know enough about the mechanism of memory and the way the brain works to do any fundamental research. This affects a number of fields of human activity. Because of this we have to make a number of basic policy decisions according to our fundamental beliefs. An example of such a policy decision is the decision to raise the school leaving age to 16.

Secondly, the objective of any research should be to provide better or cheaper services, having regard to the basic policy decisions. We all know what we mean by 'cheaper' but the meaning of 'better' does, I agree, need clarification. Our primary problem is to decide what to do and then to decide how to do it. Technical and political possibilities can, I agree, influence the decision about what we should attempt to do, but the first priority is to decide what should be done. It is a peculiar feature of the library and information world that it has concerned itself more with how to do things than with what to do. This could be illustrated by the history of attempts to use computers in libraries.

Now if we are to approach this subject scientifically we need to collect facts. Here I must draw attention to a simple rule which is often neglected—a fact can be what somebody does. It is not an opinion about why he does something, nor what he thinks he might do in some hypothetical situation. Investigating opinion may have some part to play in deciding how to proceed. It should have no part to play in deciding the fundamental question 'what should be done'. For that we need facts, real facts, facts which are relevant to some possible decision. It is no use measuring how many red-haired librarians we have. We just cannot use such facts.

If we are to measure anything we must make sure that there is a relevant unit. Here the situation has become confused by the cost–benefit drive, and in particular the attempts to evaluate the benefits in financial terms. A great deal of public money would have been saved had OSTI adopted as its motto 'You cannot evaluate sunsets'. This notion applies in particular to the attempts which have been made to evaluate information services in financial terms. Occasionally you can find a value for some particular information but these occasions are rare; such questions as the contribution of libraries to the education system just cannot be answered scientifically when we are unable to measure the output of either the educational system or the information system in any sensible, let alone comparable, units. On such questions we are driven to rely on our faith. If we believe that a library has a contribution to make to an academic institution then we can investigate to what extent it is used, whether it has adequate accommodation for those who want to use it, and whether it can provide the books which the readers require while they still need them. As it is rarely possible to evaluate services or their deficiencies in money terms, it is necessary for decisions to be made about the allocation of resources between information and other activities. There are two things we must recognize about such decisions. First, they are somewhat arbitrary and secondly, they are not made, as a rule, by librarians and information officers. It has always amazed me that the library world has not appreciated that the major decisions about libraries and information matters are not made by librarians. At present, for example, a so-called research group is attempting to use a group of librarians and the Delphi procedure to forecast the future of Public libraries—what a waste of effort!

Of course, there are problems internal to a library system which can be investigated—for instance, whether the selection system selects the publications which are subsequently required or whether the recording system could be simplified.

With regard to possible new services there is at present no satisfactory method of estimating the likely demand. The best thing we can do is to start a new service on an experimental basis and see what happens. After that, all we can do is to make a value judgment based on the cost and the use of the service. Such decisions are necessarily arbitrary, for let us be clear that information science and library science, whatever they are, they are not exact sciences. This is a conclusion which I think OSTI should have accepted a long time ago. It would have enabled them to reject out of hand some research projects they have paid for, no doubt because they were confused by the reports they received from their referees who seemed to be impressed by the academic veneer some research proposals have.

I speak as an applied mathematician. I trust you all know the difference between a pure mathematician and an applied mathematician—the latter is concerned with being close enough for all practical purposes! Bradford's observations on the scatter of references among periodicals was a useful observation on the nature of the real world. But the more recent attempts at curve fitting in this field are a good example of the worst aspect of the academic approach. This type of investigation cannot have any practical results.

A long time ago I used the ideas behind Poisson's distribution to decide when to duplicate or triplicate periodicals. I did in fact satisfy myself that the demand for a limited run of a periodical was approximately random. That was near enough for all practical purposes. In fact if you assume mathematical randomness for the demand and this is not true, then the duplication you deduce from randomness is on the conservative side in practice—and this is administratively desirable. There is little practical value in having a more precise model.

But let me return to 1948. The one really important thing I learnt from that first user study was that it is quite easy to collect interesting but useless information. It dawned on me that the real problem facing librarians was not to describe the world but to change it. So I tried to limit my research activities to collecting and analysing the relevant data to distinguish between possible lines of action.

This was the policy I pursued from 1948–56 when I was in DSIR headquarters. There I had access to those who were able to authorize changes of policy and some opportunities to collect the relevant data. However, the resources available to me for data collecting were so limited that they could only be used to collect data which was critical in determining policy.

By 1956 there was enough data to justify the development of an NLL, but it was not clear whether in fact the powers that be would authorize it. So I decided to assemble and make available a summary of the data and the policy decisions to date. I offered this paper to a joint meeting of Aslib and the London U & R Section of the Library Association. Whatever I intended to say was altered to some extent by the fact that before this meeting actually took place I had been made responsible for starting the NLL.

I will never forget that meeting. It was a Saturday afternoon in the old Chaucer House. The paper was in reality the first report of an official committee, the evidence on which the report was based, an account of the administrative decisions which had been made and an outline plan for a new library. It was all rolled into one and presented in three-quarters of an hour. Very little of what I had to say had previously been published. There was silence as I spoke and a very strange silence when I finished. Then pandemonium broke out. Before the meeting finished I had learnt something important. When I started on the NLL project I had imagined that my main opposition would come from the Treasury; after that first paper on the NLL I realized that one of the major problems I faced was to make sure that the library world and the Treasury did not join forces against me. That conclusion precipitated a change of emphasis in my professional activities from Aslib to the Library Association. At that time, of course, the distinction between information and library activities was much greater than it is, fortunately, today.

Starting the NLL was an exacting but exciting experience. It was like trying to protect an unborn and very young baby from a host who would deny it life, but luck was on my side. The first critical decision was to start by collecting Russian literature. At the time I knew that the UK holdings of Russian literature were significantly worse than the holdings in the other languages of importance in science. So the new organization could make a major difference in this field. On the other hand I knew that the total demand for Russian publications was quite small. So this decision was a gamble. It paid off because just after the LLU had announced in 1957 that it had a collection of Russian publications, the Russians sent up the first Sputnik to advertise the collection.

The decision to accept the industrial buildings on a site at Boston Spa will remain of importance for better or for worse for a long time to come. The ministry of Works suggested about fifty possible places. Boston Spa was only included in the list by accident. I set out to inspect about thirty of these places believing that it was most unlikely that any would be suitable. Most of them were clearly impossible. I thought the buildings at Boston Spa might just do. I was helped to arrive at this decision by some experience I had by chance during the war in arranging for buildings created for one purpose to be used for other purposes. I knew that if I accepted some existing buildings I might be able to jump the DSIR building programme queue. So I made what was probably the biggest gamble of my career. It did in fact enable the NLL to jump the building queue. It by-passed the view then existing in some official quarters that the science lending library was a second priority to the science reference library. The decision to take Boston Spa enabled the NLL to start, but it nearly had a disastrous effect on my career. After I had accepted Boston Spa the permanent secretary of DSIR came to see what I had done. Some demolition had started and the site looked like a dog's breakfast. I had the uncomfortable feeling that the permanent secretary thought I had been an idiot. Fortunately, as I had already committed the Department, he took no further action.

That incident reminds me that according to modern practices the decision mechanism in the early days of the NLL was somewhat strange. Looking backwards, it seems that this and sheer luck were important factors which enabled the NLL to start.

By Act of Parliament the DSIR Council, which had been advisory, became executive in November 1956. At the first meeting as an executive body perchance the council had to do something about the science lending library. They decided to go ahead although the financial authority to permit this decision did not really exist. So it happened that the lending library became the first child of the new executive council. At the time there was much discussion in DSIR about the nature of the committees which were responsible for the DSIR establishments. Knowing this, I asked the permanent secretary, Sir H. Melville, what sort of committee he thought I should have. He told me that he thought I knew what to do. So I went ahead without any committee other than a sort of consumer council. It was very fortunate that the responsibility for starting the new library fell to DSIR because that Department had evolved some useful practices for decentralizing its administration. I once enquired what were the powers of a DSIR Director. I was told that I could do what I liked, but I would be shot if I made a mistake.

So I was able to go ahead without the fetters which the modern ideas about committees impose. In the early days—before the chairman of this meeting joined the NLL staff—my main assistant was Miss Bunn. Here again I was lucky because she proved to have a large supply of commonsense, which proved invaluable in deciding what to do.

I have outlined the situation about the starting of the NLL because it has dawned on me recently that the NLL really was a new species of library. As a rule a new species only emerges when the conditions for its continued existence are favourable and the conditions for its creation are particularly favourable. The former undoubtably now pertains in several countries, so it may seem surprising that NLL's have not developed elsewhere. One of the reasons for this is the fear among academic librarians that the creation of a central service from public funds might result in a reduction of resources to other libraries. I am sure this fear is not without foundation. This fear undoubtedly existed among university librarians in the UK, but fortunately for the NLL the university librarians were not able to influence the decision makers.

Since the NLL became established I have been suggesting that university librarians should openly recognize the danger that the existence of central services would affect their resources.[4] Decisions about the extent of the use of interlibrary services might be made by sheer cost considerations—is it cheaper to borrow or to buy? However, I suspect that, despite the rise in postal charges, many academic libraries would be very much smaller than they are today if they applied such a criterion. As a result the availability of items from local resources would become very much smaller. Now it seems to me that there are minimum standards for the local availability which are acceptable. In consequence it appears to me that academic librarians must begin to think of availability standards. The current economic crisis makes this a matter of special urgency. Without availability standards, librarians are in the same ridiculous position that heating engineers would be if they tried to discuss heating problems before the development of the concept of temperature. Surely academic libraries must develop availability concepts so that they can have some rational basis for deciding at the publication selection stage when to acquire and when to rely on Boston Spa?

You will note that I assume that it will be practical in the future to rely on Boston Spa to an increasing extent. This should be possible provided that financial, technical and legal difficulties do not arise. On finance the case for adequate financial support remains that Boston Spa is a national economy. The available techniques appear to be able to deal with a much larger demand. The one cloud on the horizon appears to be possible limitations imposed by changes of the law regarding copyright. When you say that Boston Spa produces photocopies of about one million articles per year it sounds a lot, until you appreciate that Boston Spa is receiving somewhere about 400,000 periodical parts per year. Then you realize that the photocopying at Boston Spa should be making little difference to the production of periodicals. The evidence supports this view. The number of periodicals published appears to be continuing to increase. The position may change more due to the increasing cost of paper and printing than anything else. In case it does I think that the library and information world should be making the point now that it would not matter. In the past, periodical publishers, confident that there was a captive library market, have continued to publish more and more periodicals. The present economic pressures on libraries may change this situation.

Undoubtedly the expansion of the frontiers of knowledge has been facilitated by the growth in the number of periodicals published. But I think we should be clear that the expansion of periodical publishing is not an essential requirement for the development of intellectual activity. What is essential is that the potential user should have easy access to the records of progress. Library copying facilitates this. If a conflict arises between library copying and periodical publishing we should remember that, as the development of report literature has illustrated, periodical publishing on the present scale is not an essential requirement.

Once the NLL was established it became more and more obvious that the arrangements for the national libraries needed overhauling. The rearrangement of the government department responsibilities for library service in April 1965 made some fundamental changes in the administrative arrangement highly probable. You may ask whether the changes which have occurred were for the best. I have often been asked this question.

Looking backwards, it seems to me that once it was clear that the NLL idea worked the extension of the subject scope of Boston Spa to all subject fields, and the merging of the NCL and the NLL, was inevitable. It clearly is desirable from the users' point of view that all the central loan services should be available from one point. Similarly it has been clear for a long time that the strange situation, which gave birth to a national bibliography divorced from a national library with an unnecessary duplication of bibliographic activity, would have to be rectified sooner or later.

What was and is by no means so clear is that it would be a good thing to unite the lending and the reference activities under the same authority. The success of this approach has yet to be proved. It will depend upon a number of factors including the way the relative importance of lending and reference is assessed within the British Library, and the extent to which traditional practices, particularly in the Reference Divisions, can be replaced by more modern techniques and a more modern philosophy. I know that there are special difficulties in doing this in the Reference Division because of the way most of the senior staff have been recruited. I feel I can speak freely on this subject because I was recruited to the civil service as an Assistant Keeper. My interviewers were looking for a scholar and not a potential library administrator. I think it should now be recognized that no library post is intended as a sinecure for a scholar—it is not intended to enable one man to study but rather to enable one man to facilitate the studies of many.

From a research point of view I have never had any doubt that it was more important and economic to get the book to the man than the man to the book. Tradition has never quite appreciated this. The essential fact is that a reference library wherever it is located cannot serve the country as a whole in the same way that lending service or a bibliographical service can. The British Library will, I think, be judged in the future by the extent to which it appreciates this. Since its formation there has been some progress. For instance, photocopies of periodical items held in Bloomsbury are now being supplied at the request of Boston Spa. However, the extent to which there will be actual lending from Bloomsbury will be critical in assessing whether the establishment of one authority for the lending and reference functions was a good thing. It may have been the wrong decision because the reference and the lending divisions are different species. One is a library; the other is a library for libraries. Only time can tell.

I used to be surprised that the techniques evolved at Boston Spa have had so little influence on the techniques used in other libraries. The common explanation is that the NLL's problems were somewhat different to those of other libraries. Moreover, the newer NLL techniques appear to have been introduced to deal with specific local problems. In one sense all this was true. The special problem the NLL faced was the problem of dealing with a rapidly growing demand with a civil service limitation on the total staff numbers. However, looking back it seems to me that the Boston Spa innovations could have been deduced from a basic philosophy which had more than local application.

This philosophy begins with the simple observation that as a rule the larger the academic library the more complicated are its procedures and the greater the processing times. Somehow this situation reminds me of the history of the dinosaurs, or to use a more modern analogy, it is the sort of thing you might expect if you tried to increase the volume of activity of a cottage industry. This analogy suggests that somehow the industrial revolution failed to affect library processes. There is a great deal of evidence to support this view. Librarianship is still presented as a craft with its mysteries preserved by the craft. Instead of standardization we have libraries with their own peculiar procedures. This is best illustrated by the cataloguing situation. However, the usual increase of unit costs with the size of an academic library is the most direct evidence of the thesis that somehow the lessons of the industrial revolution have not been generally applied in libraries.

Some appreciation of the fact that most libraries are unable to handle efficiently the volumes of activities which arise has led to many attempts to use computers in libraries. Often in unit cost terms this has not been successful. The trouble, I suspect, is that it is difficult to jump successfully from the craft philosophy of a cottage industry to that of the computer age, because of the need first to abandon the philosophy of the craft approach and then to simplify and standardize.

This I think is best illustrated by the prevailing approach in academic libraries to library recording. I could speak for the rest of the evening about the philosophic approach to catalogues, but tonight I propose to limit my remarks to one of the philosophical differences between a craft approach and an industrial approach. With the craft approach there is a conscious striving for perfection without regard to the cost. In many libraries, catalogue entries are checked and rechecked to see if they satisfy some local non-standard system before they are filed. Possibly this improves the final record marginally but its usefulness is reduced because it holds up the availability of acquisitions, often by weeks or months.

The industrial approach recognizes that there is a law of diminishing returns—that after a certain point it is far too costly to strive for perfection. The net extra benefit may be negligible or even negative. It may be possible, for instance, to increase the real availability of the publications by preparing more rapid and less accurate records.

This to my mind illustrates a maxim which some libraries never seem to appreciate and which I trust the British Library will never forget—'the best is the enemy of the good'.

REFERENCES

1 URQUHART, D. J. The distribution and use of scientific and technical information. *J. Doc.,* 3 (2), March 1948, p. 222–31.

2 URQUHART, D. J. *Proc. Royal Society Scientific Information Conference,* p. 408–19. Royal Society, 1948.

3 URQUHART, D. J. National lending library for science and technology. *J. Doc.,* 13 (1), March 1957, p. 13–31.

4 Annex to Appendix 9, p. 280–81. Report of the Committee on libraries. University Grants Committee. HMSO, 1967.

DISCUSSION

PROF. B. C. VICKERY (University College London) asked Dr Urquhart to comment on staffing policies, past, present and future, of the British Library.

DR URQUHART in reply said that he understood that the British Library was aiming to have a common grading structure for all its staff—once a man was recruited, promotion would be on merit and not on paper qualifications. It was undoubtedly true that there was a great deal of routine work in libraries. The problem was to provide sufficient variety of work and job satisfaction for individuals without losing the advantages of the division of labour which the industrial revolution made possible. He gave examples of how this had been achieved at Boston Spa.

MISS M. GOSSET asked whether there was not a Committee of the Lord President's Office which considered the setting up of a National Science Reference Library and a National Science Lending Library out of which grew the conception of the National Reference Library, was this not in 1946, and we have not got it yet.

DR URQUHART replied that the recommendation about the creation of the NLL was made in 1954 by the Advisory Council on Scientific Policy which had previously recommended the establishment of the National Science Reference Library. It was only in 1956, however, that it was decided which Government Department (DSIR) would be responsible for the NLL.

MR ALAN J. MAYNE (University College London) said that he would like to look forward and raise the question of the possible impacts of recent and forthcoming technological advances on libraries and information services. For example, how far, if at all, should hard-copy books be replaced by microfilms and microfiche for library collections and loans to users? There have been many recent developments in computing; for example, computers can already be programmed to output microfilm or microfiche, and text-editing has advanced far enough to use computers to prepare documents. Telecommunications continue to have a rapid flow of innovations, and it may soon become possible for information, retrieved in response to an enquiry, to be displayed on a user's own TV screen. During the coming years and decades there are potentialities for considerable, if not radical, changes in the nature and operation of libraries and information services; there is scope for extensive applied researches on these possibilities.

MR H. P. CEMACH (Anbar Publications Ltd) said that the speaker had criticized librarians for adhering to the craft approach and failing to embrace the industrial approach. Speaking as a non-librarian, and comparing the strike-ridden and bankrupt British motor industry with its prosperous Swedish counterpart that has started on the long road back to the craft approach, it seemed to him that the day may come when librarians will be praised for their 'failure'; it may well one day be seen as having saved them the need for *two* changes.

Library-based information services in higher education: towards a reappraisal

Gerry M. Smith

The City University

Abstract

Some British academic libraries are offering information services which are misconceived and/or inappropriate. There is also a possibility that some services canvassed as a means of improving academic library standards are, in fact, contributing to their decline.

The provision of such services is in need of reassessment and the efficiency and effectiveness of individual services need to be monitored closely. The 'mix' of services and their place in the totality of library services need careful planning and scrutiny. A model service is prescribed which includes enquiry service, induction, instruction in literature searching techniques, publications and current awareness services. It could probably be adopted by most general academic libraries without extra funding or could be used as a checklist against which to evaluate existing information units.

WHITEBRICK UNIVERSITY LIBRARY has an Information Department with a firmly established national reputation. Its three members spend a significant proportion of their working hours operating a manual SDI service for about 30 academics; they also do a fair amount of teaching and spend a lot of time 'discussing information needs' with 'clients'. This library has a chronic acquisitions and cataloguing backlog and several understaffed branches.

Newtown Polytechnic Library's information activities are tightly controlled by its efficiency-conscious Chief Librarian. The section's three members work very hard: an attractively printed current awareness bulletin is produced for the academic department which gives the Polytechnic its distinctive reputation; the bulletin is sold outside the Polytechnic (about 30 copies are sold, fairly cheaply). Undergraduates are well catered for: plans are being finalized for every student to receive 18 hours of library-based tuition in his three years of study.

Blankshire University Library has an enviable staff structure and a generous establishment. Although, like many academic libraries, it has a two-year cataloguing backlog, it does have an information section with three very well-qualified librarians, plus clerical support. As they are not located in the library's public areas, they are not called upon to offer a reference service. They once prepared a tape/slide guide to the library and still use it when showing a few students round the library at the start of each session. There is not really enough time to give any formal tuition in bibliographical research methods. They have not yet produced many publications; they do, however, manage to offer a few senior academics something of a current awareness service, sorting and re-routing PICS circulars. The section seems very busy.

Aslib Proceedings, 27 (6), June 1975, p. 239–46. Printed in Great Britain

Were these libraries (which I visited recently) atypical, there would be little cause for concern. However, extensive experience, discussion and reading tend to confirm my suspicion that some British academic libraries are offering information services which are misconceived and/or inappropriate. There is also a possibility that some services, canvassed as a means of improving academic library standards are, in fact, contributing to their decline.

The persuasive case for the adoption of special library standards of information service was based on the observation that members of academic communities were not exploiting the facilities of expensive academic libraries to their best advantage. It was argued that it was both necessary and possible, by offering library-based information services, to improve the library and information-seeking habits of most groups within the academic community. The most adventurous type of service emphasized a positive enquiry and current awareness service for academics in the sciences and social sciences.[1] The aim of pioneers in this field was a service providing information, not the location of information.

I wish to argue in this paper that the provision of academic library-based information services is in need of reassessment and that the efficiency and effectiveness of individual services need to be monitored closely. The 'mix' of services and their place in the totality of library services need careful planning and scrutiny. A model service is prescribed in the belief that it could be adopted by most general academic libraries without extra funding, or that it could be used as a checklist by which to evaluate existing information units.

Enquiry service

The most commonly encountered type of information service is, of course, the reference/enquiry service. Although such services have been provided for many years, there is little public discussion of their function, use patterns or performance evaluation in an academic environment. This is regrettable because the enquiry service is potentially the most important component of any information service.

An enquiry service has three functions: to maximize the exploitation of the library's own stock; to supply small items of information on request and to encourage systematic use of the entire 'information system' by giving advice to users (subtly and informally) when they present specific problems. The essential philosophy of the enquiry service should be the encouragement of self-help.

Many proponents of academic information services argue that the service should include the preparation of retrospective bibliographies on demand. Having supplied such a service myself, I would argue against the provision of such a service on the following grounds: (i) cost—the preparation of a fairly comprehensive bibliography on a specific subject can take up to 20 senior man-hours, at a total cost to the parent institution of over £100; (ii) quality—however well-informed the member of staff compiling the bibliography, it is probably more efficient for the originator of the request, with his background information, unstated assumptions and emphases of interest, to undertake the search; (iii) boredom—compiling bibliographies for someone else is one of the least interesting tasks academic librarianship has to offer; (iv) perpetuation of ignorance—the teacher or research worker who can obtain custom-made bibliographies will not be motivated to learn and use the documentation system available to him; his ignorance will probably be perpetuated by those who model their working habits on his. The compilation of specialist bibliographies is likely to be worthwhile only when they are required to support exceptionally important new developments in teaching or research projects.

Although it forms part of the 'credo' of most librarians that good services encourage use, we really know very little about the factors that affect the use of an enquiry service (although it is pretty safe to assume that unpleasant or unhelpful incumbents depress demand). The level of use of enquiry services probably depends largely on factors outside the library's control: in the academic environment the main factors are likely to be course content and prevailing teaching methods. Humanities and social science teaching and research tend to generate more business for the enquiry service than the pure and applied sciences and technology. Teaching methods which encourage free-ranging individual exploration will tend to produce longer queues than methods relying on close supervision and tight restriction of the range of interests the student is encouraged to pursue.

Apart from an intimate knowledge of the resources and systems of the library itself, enquiry personnel should possess two distinct types of expertise: a good knowledge of the literature of their specializations (the person dealing with the social sciences, for instance, should ideally be able to recommend heavily-used monographs on subjects as diverse as internal auditing, social stratification and political pressure groups without referring to published sources) and an intimate acquaintance with the documentation system of the subjects covered by the library (he should be the institution's expert on the bibliographies, indexing and abstracting services, reference material and specialized libraries/information centres within his own subject field).

Teaching

On the evidence of programmes currently on offer in higher education the library teaching function is often misconceived. Course objectives, content, methods, timing, length and integration seldom exhibit evidence of realistic planning. The formal 'teaching' programme of an academic library should be restricted to two categories of instruction: induction and introduction to literature searching techniques. The former is relatively simple to provide: the new undergraduate student's first contact with the library should be a short talk by the Chief Librarian at the institution's formal welcome to assembled newcomers. Such a presentation 'places' the library as a central resource within the institution. No attempt to present more detailed messages should be made at this point. This should be followed by a timetabled visit to the library by new students in departmental groups. Here the student should be shown a tape/slide or videotape introduction to library services and collections, followed by the (unnecessarily reviled) short guided visit to the major sections of the library relevant to the work of each group. Such a programme gives newcomers an idea of the library's stock and layout, and introduces them to the rudimentary skills necessary to use it effectively; it also introduces at least one friendly face from the library staff who can be consulted by them as the need arises. If this short presentation takes longer than about 40 minutes it is too long and should be pruned. The content of the presentation should be reinforced by the distribution of a library guide. Similar visits should, of course, be organized for new postgraduates and academic staff.

Courses in literature searching techniques require rather more preparation. Their objectives should be (a) to confront users with the novel proposition that there is more published literature relevant to their work than that small proportion normally recommended by teachers, and (b) to indicate the methods of locating such material. The course should also attempt to motivate users to become efficient self-directed learners. In essence, the course of instruction should aim to change deeply-formed attitudes and modify behaviour: it is a 'sales job'. A senior librarian is on record as organizing literature searching courses for undergraduates lasting a total of four hours. Such courses should not need to last more than 60 minutes. They are often far too long because they attempt to cover too many subjects in too much detail. Some of the lengthy courses even feature subjects such as communications theory and techniques of report writing. What particular qualities enable librarians to teach such subjects? A simple method of pruning such courses is to ensure that the content is specific to the needs of those who are supposed to benefit from it. A good published guide should be provided. Guides produced by librarians are often definitive listings of bibliographical publications, many of which are of little use because of their age, poor coverage, or worse still, considering recent findings,[2] foreign language content. Some bibliographical products recommended by librarians are of an appalling standard. Students need advice on the *best* sources for their purposes, not a display of the librarian's encyclopaedic, uncritical knowledge of the whole range of such services. The case study method of teaching such courses seems a laborious way of imparting a few simple messages and straightforward supporting information.

Some recent trends in reader education, including compulsory attendance and formal examination of knowledge gained by students, seem likely to make such courses unattractive to participants, many of whom will be initially doubtful of their value. Real learning takes place not in the seminar room but when the customer attempts to apply his new knowledge. For this reason such courses should be linked closely to academic timetables and presented just before the user will benefit from the possession of literature searching skills.

Two other conditions seem important for the successful operation of worthwhile bibliographical research sessions: they should be legitimized by the explicit support of academic departments (which can be manifested by being timetabled by departments in rooms normally used by them, the sessions being introduced by a member of the teaching staff); secondly, they should only be offered to people whose studies require the use of skills imparted by the library staff (e.g. by students who do fairly lengthy research or project work). Many undergraduate and some postgraduate students simply do not have information problems! Although the academic librarian has a useful and rewarding teaching role to perform, it is easy to fall into the trap of offering badly constructed courses to people who do not need them.

Publications

It seems incongruous that an occupational group claiming to deal with 'information' should produce publications of such variable quality. The better institutions produce material which has the following qualities: crisp writing; minimum information content required to transfer the message to the reader; attractive production by professional printers in a handy size (*e.g.* A5); publications planned and written as part of a series; a house style which does not date; a clear up-dating policy, planned before production commences. The series should reach all people who may make use of it. If the publication concerns bibliographical research a recommendatory preface by a respected senior academic involved in research (to add legitimacy to the publication) is helpful. It would probably raise the level of library publications if a group such as SCONUL were to evolve standards and sponsor a series of guides to information research in specified subject fields (as they now do with tape/slide presentations). The fact that such guides would not carry 'local' information such as classification numbers would be beneficial, as this would encourage users to consult library staff when exploring the sources listed, thus giving the staff a chance to offer detailed advice when the user was most receptive.

Current awareness services

The operation of current awareness services is probably the key service that a library in higher education can offer to its teaching and research users. It is also the activity which, unless realistically planned and monitored, can absorb the greatest amount of staff time in achieving results which are, to say the least, difficult to evaluate.

The most ambitious current awareness service yet offered in Britain (and one which has had a significant effect on the thinking of many academic librarians) was the personalized information service offered by experimental information officers to social science researchers at Bath and Bristol Universities a few years ago, in which 75 per cent of staff time was spent on offering a manual SDI service.

> The whole service was rated highly by nearly all users and considered to be a high priority among the various possible claims on university resources. Those who had the closest contact with the information officers had the best scores on most aspects evaluated and rated the service most highly.[3]

My own (much more limited) experience of operating such a service was not quite so encouraging. I initially attracted fifteen takers. Monitoring the usefulness of the service led me to reduce this to those five who were clearly gaining some benefit from the service. The other ten were dropped because: (a) they were really not too interested in keeping up to date (exhibited by lack of interest in asking for copies of references rated by them as 'essential'); (b) their interest profiles were too broad to handle (*e.g.* 'economics'); (c) there was very little published material in some of the narrower fields; (d) some of the documentation services used for searching were inadequate. Running the service for the remaining five took 10 per cent of my total time. The service was withdrawn. Although my own impressions are incapable of rigorous testing, I would maintain that manual SDI services are an expensive luxury in an academic environment. The costs of providing manual SDI are much higher than the available alternatives discussed below. Searching for references for someone else on a continuing basis is a tedious, clerical skill not requiring the abilities normally possessed by senior staff of academic libraries. My final objection is that such services *should not* be provided. Although the proponents of such services have based their case for provision partly on the claim that academics are under increasing time pressures, this is far from proven. Even if it were to be proven, it is important that activities such as keeping up to date are not sacrificed: academics are paid generous sums of money to keep abreast of the latest thinking in their specializations. It would be scandalous if this activity were to be neglected by academics and performed on their behalf by others, at extra expense.

The provision of personalized SDI services may become a more feasible proposition as more of the existing documentation services are mechanized, attract more customers and are offered at prices which institutions of higher education can reasonably be expected to afford. This state of affairs is, however, still a distant proposition in many subject areas; there is at the present time, for example, no service in business and management studies which I would feel confident about recommending or subscribing to on behalf of my own academic colleagues. When such services become available, the information officer's role will be to continuously review and evaluate the services on the market, alert potential users to their existence (and that of alternatives), help in profile construction and monitor the benefits gained from subscriptions.

In the absence of such services, it is still possible for academic libraries to offer effective current awareness services, the most obvious type of service being the contents bulletin. Users should be located by written circulars. All the takers should then be divided into subject groups and then subdivided by geographical proximity; circulation lists, with a maximum of about six names per list, are drawn up and the bulletins circulated on a regular basis, as frequently as necessary. Checks should be instituted to find out whether circulation bottlenecks occur and the lists modified so that those passing on the bulletins quickly can be placed higher on the lists, the inevitable hoarders relegated to the bottom (rank should be disregarded when drawing up such lists). In those subject areas where good, externally produced services are available (*e.g.* economics and management), the relative cost of circulating those, as against production in-house, should be compared. This kind of system, apart from costing only a few pence per recipient per week, has substantial advantages for the user: when a library produces its own bulletin it tells him what papers in his field have recently arrived in the library; when externally produced services are circulated, he is often alerted to the existence of journals of which he was, at best, only vaguely aware; his interests may be stimulated by the 'serendipity' effect of flicking through bulletins (the ideas thus stimulated cannot be easily predicted and therefore cannot be provided for on a systematic basis); recipients can scan the output of new journal articles without the distortion possible if someone else is doing the searching for them. Such a service only becomes expensive when large numbers of customers are involved; many academic institutions are unlikely to contain enough interested staff to make this a real problem.

Unless it is already provided by a press officer, the academic library is also in a strong position to provide another current awareness service for its teaching, research and administrative clientèle—the 'news digest'. The object of this type of service is to provide, in a central location (*e.g.* a Common Room), a file of cuttings on the institution, higher education etc. taken on a daily basis from the national and specialist press. The sources of cuttings can, of course, be greatly enlarged by subscribing to a press-cuttings bureau.

Some organizational implications

Services such as these should be introduced gradually, over a period of years rather than months. They should be introduced in the following strict order of priority: (1) reference service, (2) induction, (3) instruction in literature searching techniques, (4) publications, (5) current awareness services. Such services should not be contemplated until the traditional library functions are operating smoothly: the collections must be the best possible within existing resource constraints; they must be well organized and accessible. The hypothetical objection to the introduction of reader instruction, discussed (and rejected) by one of our leading academic librarians,[4] that the Professor of Exobiology might oppose it on the grounds that library staff time would be better spent on eliminating its cataloguing backlog, appears to me eminently reasonable. Information services *should* come after collection development and organization in library priorities. Library users regard libraries first and foremost as organized document collections. To ignore this fact of life is a positive disservice.

Although the levels of service envisaged in this paper could possibly be provided by a separate small unit of information specialists, such a structure might be divisive, encouraging the formation of an élitist information *corps* isolated from the other divisions of the library. A more important objection to this type of structure is that, as information work is a valuable complement to the other major library tasks, development and organization of collections, it ought to be fully integrated with them. Knowledge gained of library use and literature searching behaviour of different user groups can also be useful in planning and administration. Information services should therefore, preferably, be provided by librarians organized by subject specialization; the extra work load is only possible if the clerical work done by many assistant librarians in academic libraries is systematically delegated; it will not disappear.

The academic library has an important role to play as an agency of information transfer. Care must be taken to ensure that only realistic services are offered; the keynote of all services offered should be the encouragement of self-help; 'spoonfeeding' of any group is to be avoided.

REFERENCES

1 The most persuasive case for this level of service is presented in: LINE, M. B. Information services in university libraries. *J. Lib.* 1 (4), October 1969, p. 211–24.

2 SAUNDERS, W. L. The foreign language and translation problems of the social sciences. *Aslib Proc.* 24 (4), April 1972, p. 233–43.

A manual current awareness service at the University of Aston

Ida Vincent

Sandoz Australia Pty. Ltd., North Ryde, Australia

John H. Seals

University of Aston Library

Abstract

A manual current awareness service, based on abstracting and indexing journals, and serving ten groups of staff and research students at the University of Aston Library, is described. The service is evaluated in the light of client reaction and feedback obtained from the request service. The relation of the service to other library activities, and possible future developments are discussed. Two sample profiles are given in an appendix.

THE PROVISION OF information services is increasingly recognized as a legitimate, indeed vital, function of the academic library.[1,2,3,4] Most progress has been made in those areas which make relatively smaller demands on staff time, namely reference services, instruction, and in some cases the provision of retrospective literature searches. The establishment of manual current awareness services on anything approaching the scale attained in some special libraries poses formidable difficulties, and there have been few published accounts of such attempts in British academic libraries. A manual current awareness service is in operation at The City University,[5] though its future is under review.[6] In the social sciences, experimental services funded by OSTI have been conducted at the universities of Bath[7,8,9,10] and Durham.[11] At Bradford University a service similar to the one described below has been abandoned in favour of commercial services.[12] Indeed the general trend, especially in science and technology, appears to be towards developing the library's role as intermediary between commercial SDI services and the user.[13] Perhaps we at Aston have been swimming against the tide in developing a manual service: nevertheless our experience has shown that such services have a role to play, and that their introduction need not place an unacceptable burden on the staff of a small university library.

We are aware that we may be criticized for publishing an assessment based on subjective judgments rather than on objective evaluation. Our justification is that when planning the service we would have benefited from having available more accounts of the experience of others, particularly accounts which went beyond theory and exhortation to deal with mundane practicalities. This paper is published in the hope that it may be of some value to colleagues in a similar situation.

Aslib Proceedings, 27 (6), June 1975, p. 247–61. Printed in Great Britain

The service is described as it operated from its inception in the spring of 1972 until November 1973. Since then it has continued to develop along similar lines, with the addition of six new profiles between November 1973 and April 1974.

Background

The University of Aston is a technological university, with teaching and research concentrated in applied science and technology, management, and the less theoretical areas of sociology and psychology. In 1972/73 there were about 400 academic staff and 3,876 students, of whom 336 were research students. In common with those of most new universities the library suffers from inadequacies of stock and facilities, deficiencies in part compensated for by a vigorous and expanding programme of services to readers. When the current awareness service began, in the spring of 1972, a number of information services were already in existence. Conventional reference and enquiry services were available to all members of the university. Retrospective literature searches were carried out on request for staff and some postgraduates, 86 being completed in 1971/72. Undergraduate and postgraduate instruction programmes were well established. A fortnightly current awareness bulletin on higher education was produced, and distributed inside and outside the university. A current awareness bulletin for economics and management, in the form of photocopies of journal contents pages, had recently been introduced. One ASCA profile and three CA-Condensates current awareness services were being paid for from library funds. In September 1971 the establishment was increased by one, an assistant librarian with special responsibility for the development of the information services and instruction programme.

In the spring of 1972 the authors attended a number of departmental staff meetings with the aim of further publicizing the information services already available, and assessing potential demand for a current awareness service. Most interest was shown in the established services (the meetings thus served a useful purpose in demonstrating to library staff the inadequacy of the existing publicity), and initial response to the current awareness proposal was cautious. It was therefore decided to begin the service experimentally for any group or individual offering a suitable subject. Once the first profiles were established, demand soon snowballed, largely through the recommendations of the original recipients of the service.

Method of operation

Profiles were constructed after an initial discussion with the groups or individuals involved. Some of the prospective clients were persuaded to submit a written statement of the subject in advance, and this proved invaluable as a basis for discussion, especially in cases where the librarian was not familiar with the subject area. After three trial runs, librarian and clients met again to discuss modifications.

When the profile had been prepared, a list of sources to be scanned was drawn up. For most profiles *Current Contents* was the main single source, with relevant abstracting journals as a safety net to pick up references not covered in, or not retrieved from, *Current Contents*. There was little formal scanning of current journals. This heavy reliance on secondary sources evolved for a number of reasons. We saw no good reason for limiting coverage to our own stock, which is necessarily restricted both by lack of funds and by the ever-increasing output of published information. The whole emphasis of library service at Aston, as in any modern library, is moving further and further from the concept of the self-sufficient library.

Resources have been concentrated in building up a comprehensive collection of abstracting and indexing tools, and many Aston readers are accustomed to making extensive use of the inter-library loan service, which is actively promoted by the library. We therefore thought it unlikely that the inclusion of material not locally available would cause them many problems. On purely practical grounds it would have been difficult for the indexers to establish a routine of daily scanning of journals, since they were involved in a wide variety of other duties. A degree of flexibility in the time, and even the place, of indexing was therefore essential.

Staff in the Serials Section kept a record of incoming material of interest, mainly abstracting and indexing journals, and this list was circulated weekly to indexers. Each indexer kept the following records: (1) a copy of each profile for which he or she was responsible, together with its list of sources; (2) an alphabetical card file of keywords for use with the keyword indexes to *Current Contents* and other sources which were searched in a similar way (each card bore a code letter referring to the relevant profile or profiles); (3) a list of search terms and instructions for use with sources for which the keyword file was unsuitable. This list also referred by code to the appropriate profiles.

Indexers recorded references on cards, and marked each card with the appropriate profile code. From these cards typed lists were produced and a xerox copy sent to each client, an additional copy being retained in the library's files. The original cards were filed as a check against duplication. Clients were given a choice as to the frequency with which they received references, and most opted for fortnightly lists. No alternative to the typed list format was offered. Cards might have been more acceptable in some cases, but since most profiles served a group of clients, the additional clerical effort and expense would have been considerable.

All references included a library call number or location, or a code indicating that the article was not in stock, but could be obtained on interlibrary loan. If the source of the reference was an abstracting journal this was noted, so that clients could read the abstract, or request a photocopy of it. Occasionally, brief annotations were added; typically these related to the indexing term under which the reference had been found, or to the availability of a translation or English summary.

A request service was felt to be an essential element in the programme, especially as many of the references were to items not locally available. The request service adopted was similar to those already offered for library current awareness bulletins and retrospective literature searches, and its introduction therefore posed no administrative problems. Each list was accompanied by a request form. Each reference was assigned a three-part request number, consisting of the profile code letter, list number, and unique item number. To obtain a wanted reference the client had simply to record the appropriate number on the request form and return it to the library. If the article was held in the library, a photocopy was made and sent to him, the copy being paid for by his department. (Most clients were able to obtain photocopies in this way under existing agreements, so no special negotiations with departments were necessary.) When articles were not in stock, interlibrary loan request forms were completed by library staff. Requests for books, reports and theses were routed to the book reservation or interlibrary loan departments as appropriate.

Maintaining adequate contact with clients proved more difficult than we had expected. We found that they rarely approached us to make criticisms or suggestions. We for our part were anxious to avoid any appearance of pressurizing them, and being firmly library-based we lacked opportunities for the kind of continuous interaction which proved valuable to the OSTI information officers at Bath. We therefore relied largely on informal contacts in the library and elsewhere, and were sometimes reduced to lying in wait for the more elusive clients in order to engineer a 'chance' meeting. One fruitful encounter took place in a local supermarket. In retrospect, we ought to have insisted on more regular formal meetings, since experience showed that considerable time and persistence were required to uncover clients' true feelings. Some reasons for this are discussed in our assessment of the service.

Changes in clients' interests were usually discovered only by accident. Although they were all supplied with copies of their profiles, they were often extremely vague as to what was being covered. For instance one client, on being cornered in the library, finally admitted that the service was 'perhaps not quite so good on bradykinin'. On investigation this proved to be one of the interests of a new member of the research group, who had not approached us to discuss his needs, and of whose existence we were quite unaware. Fortunately, most of the profiles related to ongoing research projects rather than to the teaching or peripheral interests of lecturers, and for this reason the subject matter remained fairly static.

Details of profiles and recipients

In November 1973 ten profiles were fully operational, one had ceased with the completion of a research project, and three had been abandoned or suspended because of difficulties in establishing the precise needs of the clients. The profiles dealt with the following subject areas (figures in brackets refer to suspended profiles):

Pharmacy	5 (1)	(Profiles C, E, H, L, O)
Applied psychology	2 (1)	(Profiles B, K)
Chemical engineering	1	(Profile D)
Management	1 (1)	(Profile F)
Production engineering	1	(Profile J)

The total number of official recipients was thirty-eight, of whom eighteen were teaching staff, fifteen research students, and five members of other institutions. Some clients were known to pass on their lists to colleagues, so the actual number of people reached was rather higher. It should be noted that there were two classes of recipient, those who were involved in the initial formulation and subsequent modification of the profile, and those who received copies of the lists because they were interested in the general area covered. All the recipients in other institutions were in the second category. Of the university clients, perhaps half a dozen might be regarded as 'passive' recipients, though the distinction is not clear-cut, since those who began by receiving other people's lists sometimes went on to become fully participating members of the group.

Staff commitment

The library is organized in Technical Services and Readers' Services sections. The professional staff of the Readers' Services section, where the current awareness service was operated, consists of one Sub Librarian and four Assistant Librarians. Most of the initial planning and organization of the service was done by the authors; subsequently the Sub Librarian and three Assistant Librarians were involved to varying degrees in indexing.

Responsibility for each profile was assigned to one indexer. At one stage we experimented with a division of indexing by source rather than by profile to avoid duplication of effort. We found that this only worked well when there was close collaboration between indexers, and even then it was essential that one indexer retained ultimate responsibility for the profile, and for liaison with clients.

No precise figures are available for the staff hours involved. Indeed it would be difficult to calculate these with any accuracy, since one of the features which made the service possible was the flexibility with which indexing could be sandwiched between other duties, or combined with activities such as book selection and bulletin indexing. We estimate that, on average, each indexer spent half a working day each week in indexing and preparing lists for typing. This was in addition to the time spent on the initial formulation of the profile and on subsequent contacts with clients. Clerical staff typed the lists, and library assistants did routine checking, dispatched the lists, and dealt with request forms. Some extra work was generated in the photocopying and interlibrary loans departments.

Assessment

(i) Client satisfaction

No formal investigation of clients' estimation of the value of the service has yet been undertaken, so our assessment is inevitably tentative, and partly subjective. Our evidence comes from two sources, the completed request forms, and discussion with and observation of our clients.

Table 1 shows the number of references listed and requests received from the beginning of the service until November 1973. The number of requests obviously bears some relation to the number of references which were judged by clients to be relevant. But, for a variety of reasons, the request forms give a very imperfect indication of the overall relevance achieved by the service.

The request service was designed as an aid to clients, not as a feedback mechanism for indexers, and its use was entirely voluntary. Some clients never used it, preferring to follow up references independently. Others seem to have used it only spasmodically. There is evidence that clients were more likely to use it to obtain references which were not held in the library. (In this they were probably influenced by our practice of providing photocopies of items in stock. These photocopies were charged to departmental accounts, and the service was operating against a background of increasingly rigorous official scrutiny of such expenditure.) Some clients, particularly lecturers, were known to file the lists for future reference, or for closer examination during vacations.

PROFILE	*Number of recipients*	*Number of lists*	*Number of references*	*Average references per list*	*Number of requests*	*Average requests per list*
B	5	24	626	26	357	15
C	6	24	310	13	101	4
D	1	14	109	8	*	*
E	6	19	219	12	62	3
F	5	12	133	11	*	*
H	3	11	36	3	17	2
J	5	9	42	5	11	1
K	1	6	32	5	20	3
L	4	12	56	5	64	5
O	2	7	55	8	20	3
TOTAL 10	38	138	1618	12	625	5

* These clients did not make use of the request service.

TABLE 1: *References supplied and requests received*

In the case of the group profiles, the number of requests returned may seem low in comparison with the number of clients served. But it should be remembered that most group profiles represented an amalgam of the related, but not identical, interests of a number of individuals. In other words, not all the references listed would be relevant to all the members of the group, and many would be of interest only to one. Also, the request service was not offered to recipients in other institutions, and those 'passive' clients who received copies of other people's lists did not, in the main, make use of it.

All these factors would tend to lower the apparent success rate of the service as evidenced by the requests returned. On balance, and taking into account our informal observation of clients' behaviour in the library, we think that the relevance achieved was considerably higher than the request forms suggest.

Apart from the request forms, most of our evidence for the success of the service comes from formal meetings or casual conversations with clients. Nearly all our clients were enthusiastic about the service, and none voluntarily relinquished it. We are aware that such expressions of enthusiasm must be treated with circumspection, for reasons discussed in more detail below. Nevertheless, our impression is that, while clients were not as critical of the service as they should have been, they genuinely found it useful. One major indication of success was that nearly all requests for new profiles came from people who had heard favourable comments about the service from colleagues already receiving it.

(ii) Clients' attitude to the service

When the service began, we were preoccupied with the practical problems of subject matter and organization. Once these had been overcome we became increasingly aware of the importance of the human factors involved, and the degree to which these affected clients' perception of the service and of their role in it.

The idea of a current awareness service was a completely new one to most of our clients. This in itself is interesting, since part of the folklore attaching to technological universities is that many of their staff and researchers have experience of industry, and are therefore likely to expect, or at least to be receptive to, the type of information service more usually found in special libraries. We can only say that most of our clients not only did not expect such services, but were unaware of their existence. In consequence they were often far less critical of the service than they should have been, regarding it as an undeserved piece of good fortune which might be snatched away if they ventured to point out any short comings. Such an attitude was obviously not conducive to their playing an active and positive role in its operation. In retrospect it is clear that we did not sufficiently emphasize that this was a co-operative venture, in which criticisms were not only acceptable, but vital to the success of the service.

Clients were probably inhibited also by the degree of personal contact with the librarian providing the service. We found that recipients of commercial services were readier to criticize, and we can hardly believe that this was due entirely to our superior performance!

A third factor affecting clients' willingness to interact with the service may have been the vexed question of subject specialization. None of the indexers had formal qualifications in the subjects for which they were operating profiles. Obviously it is difficult for us to assess whether we would have given a better service had we been subject specialists. It would certainly have been easier for us to gain the confidence of clients initially. In preliminary discussions it was sometimes difficult for us to obtain the basic information we needed without undermining clients' confidence in our ability to handle the subject. It was interesting, if depressing, that they were often more inclined to furnish us with a list of key-terms than to discuss the subject in depth. Some may have made the scope of the profile broader than it need have been, on the grounds that it would be easier to weed out irrelevant references themselves than to explain the complexities to us. Most problems of this kind tended to be resolved once the profile was established, and client confidence increased. However, it remains a possibility that clients would have discussed and criticized the service more frankly had they regarded us as more nearly their equals in terms of subject knowledge.

While it is possible that some clients were embarrassed by our deficiencies, others seemed to be inhibited by a consciousness of their own. Sometimes this was because they were unfamiliar with the sources we used, and we learned to be wary of assuming knowledge even of the most basic kind. Other clients felt guilty because they had not followed up the references supplied, so that sometimes a casual encounter would result in a frenzied burst of request filing, before the client once more sank without trace.

Possibly the main single factor preventing clients from taking a more active and critical role—apart from natural human inertia—was the fact that the service cost them nothing in cash and little in effort. This may have led them to tolerate imperfections which would not have been acceptable had they been paying for the service. And in the case of one or two unsuccessful profiles, we felt that people were taking advantage of the service because it was there, without having a pressing need for it or a clear idea of what they wanted from it.

(*iii*) *Clients' own literature searching*

Initially we thought that the service would cover fringe sources, leaving clients to scan the core material themselves. This generally proved unrealistic, since the potential clients were found to have virtually no literature-searching routines of their own. In most cases we were being asked, not to relieve them of the chore of scanning, nor to supplement their own activities, but to fill a total void. This was partly because many clients were unfamiliar with basic sources and techniques, and a side effect of the service was that they learned a good deal about the secondary literature of their subjects. However, we do not think that instruction in literature searching would have provided an alternative solution to the problem. A number of our clients did know the sources, but felt unable, through lack of time or organization, to develop a regular searching routine. Among the hitherto less well-informed, a common reaction was 'I should never get round to doing that for myself'. Thus we were providing something which most clients would not have done for themselves, and we feel this to be a major justification of the service.

(*iv*) *Effect on library use*

The service appeared to have a beneficial effect on clients' whole attitude to and use of the library. Links with the departments served by the current awareness profiles became closer. For instance, several lecturers among the clients developed a more positive interest in the library instruction programme, and this attitude seemed to be reflected in the department generally. Many clients were seen more frequently in the library, and became more aware of the variety of services offered. Inevitably their demands increased in proportion to their awareness, confirming our suspicion that librarians rarely win.

It is only fair to add that library staff, and library services, did win too. Our closer contact with departments and with the work being done in them was helpful in organizing and planning the content of instruction programmes, in book selection, in our work at the reference desk. In the course of indexing we frequently came across references which we knew would be of interest to other readers, and we also ran a number of informal alerting services of the 'Let me know if you come across anything on continuous assessment' variety. Less tangibly, we believe that the whole area of reader–library relations, and the image of the library as a positive and responsive information source, were enhanced by the service.

(*v*) *Currency*

Our reasons for relying largely on secondary sources have already been explained. This policy inevitably lessened the currency of the service to some extent. In cases where we relied heavily on *Current Contents,* British articles were not often listed until several weeks after they were available in this country. (American articles were often listed before they were available in Britain, which caused clients some frustration.) In cases where *Current Contents* gave inadequate coverage, our currency was usually worse, since we then relied largely on abstracting journals.

We made a point of explaining our policy, and its likely effects, to prospective clients. Very few comments were made, and no one appeared particularly disturbed. This is no reason for complacency, since we have already remarked that our clients often had low expectations of the service. However, it would appear that currency was not particularly high among their priorities.

Because of the nature of the subjects covered, monographs did not feature prominently in the service. We scanned *British National Bibliography*, but did not attempt to cover book reviews or publishers' advertisements systematically. Our currency for monographs was therefore not good, and if they had played a more important part in the service we might have found it necessary to change our policy.

Although our policy was to send out lists at regular intervals, there were occasions when this was impossible. For example, there were delays at the beginning of the session when staff were fully occupied with lectures and seminars for new students. All our clients were tolerant of fluctuations of this kind, perhaps another indication that they did not place very great emphasis on currency.

(*vi*) *Availability of material*

Table 2 shows the number of references and requested items which were not held in the library. It would be unwise to base any detailed conclusions on these figures, since so many variables and unknown quantities are involved. But they at least indicate that clients did not find the lack of immediate availability a major deterrent, and the number of requests for items not held in the library is sufficiently high to justify their inclusion in the service.

In discussing the availability of material and the type of sources used, we have assumed that clients could have had *either* a service based on current journals *or* one based on secondary sources. Of course, in theory they could have had both. In practice a two-tier system of indexing would have been beyond our resources, and we think we chose the best solution for our particular circumstances.

(*vii*) *Relation to commercial services*

The library has funds available to pay for commercial SDI services, and requests which appeared suitable for this kind of service were re-routed, either initially or after some experience with manual indexing. In the period covered

PROFILE	**No. of refs.**	*Refs. in stock*	*% refs. in stock*	*Refs. not in stock*	*% refs. not in stock*	**No. of requests**	*Requests in stock*	*% requests in stock*	*Requests not in stock*	*% requests not in stock*
B	626	182	29	444	71	357	115	32	242	68
C	310	193	62	117	38	101	61	60	40	40
D	109	44	40	65	60	*				
E	219	131	60	88	40	62	40	65	22	35
F	133	68	51	65	49	*				
H	36	16	44	20	56	17	8	47	9	53
J	42	27	64	15	36	11	8	73	3	27
K	32	8	25	24	75	20	5	25	15	75
L	56	36	64	20	36	64	39	61	25	39
O	55	29	53	26	47	20	12	60	8	40
TOTAL 10	1618	734	45	884	55	652	288	44	364	56

* These clients did not make use of the request service.

TABLE 2: *Local availability of material*

by this paper one UKCIS service, one BIOSIS service and five MEDLARS monthly searches were initiated as a direct result of requests for manual services. Manual searching was used only where commercial services were unsuitable, or where the nature of the subject made it more economical. For example, one manual profile consisted simply of 'everything on choline acetyltransferase'. In some cases the choice of manual indexing was influenced by existing search patterns. Sections two and three of profile E (see Appendix) could have been included in a MEDLARS monthly search. However, the topics covered coincided so closely with search procedures already established for other profiles (which were not suitable for MEDLARS) that manual searching seemed a reasonable proposition.

Justification of the service

The service depends for its survival on the assumption that the majority of those entitled to it will not seek to make use of it. So far we have managed to keep pace with demand, though the margin is small. If demand continues to grow, as there is every prospect that it will, and if there is no corresponding increase in library resources, potential clients may have to be turned away. At that point it would be difficult to refute the charge that some library users were receiving privileged treatment. Our position would be made less tenable by the fact that we had allowed the service to develop as demand dictated, rather than attempting to draw up some system of priorities.

If we set out to assess the relative merits of potential clients' claims on the service, it would probably still be at the planning stage. The service we were offering was an unfamiliar one, and it would have been unrealistic to ask people to say whether, and how much, they wanted it, until they had been given the opportunity of seeing it in action.

The risk we run of encouraging a demand which we may not be able to meet is a real one, but one which we believe we were justified in taking. It would be a disservice to the research community and to the library to hold down demand to an artificial level where we could be sure of containing it. It is only by allowing potential demand to manifest itself that we can begin to assess and secure the resources needed to satisfy it.

Have we neglected other, more vital, aspects of the information function in favour of the current awareness service? There are areas, notably reference services and reader instruction, which we consider more important, in that they reach a larger number of library users. These were relatively well established when the current awareness service began, and have continued to expand and develop. If it came to a choice, they would take priority: so far we feel that not only have they not suffered, but they have actually benefited from the broadening of the library's information role.

A related question is whether it would have been more equitable to instruct all researchers in information retrieval, rather than offer a service to a self-chosen few. This is not a true alternative, since we have continued to instruct whenever and by whatever means we could. (It is ironic that the operation of the service has in several cases proved a particularly effective means of instruction.) Also, we have already suggested that most of our clients would not have done the searching themselves, even when given the necessary expertise. This attitude is by no means unique to Aston, and there is little point in our making moral judgments about it. The need for a service exists, and it is unlikely that instruction will prove a satisfactory alternative in the majority of cases.

Some readers may feel that the service should not have been offered to postgraduates, either on grounds of 'spoonfeeding' them, or because academic staff should have had the first claim on our limited resources. We feel that the question whether it is 'good' for a research student to do his own literature searching is for him and his supervisor, not for us, to decide. On the second point, we probably could not have excluded postgraduates completely, even if we had wished to do so, since their interests were often closely connected with those of their supervisors. Given the type of research group organization which exists in a technological university, we believe that a distinction between the information needs of academic staff and research students is both undesirable and impractical.

The future

Two factors seem to us of overriding importance in the future development of the service. First, ways have to be sought of making the most efficient use of inadequate resources, since it is virtually certain that these will not increase as fast as demand.

The service must continue to use commercial searching facilities wherever these are available, with library staff participating in the choice of data base and the formulation of profiles. In some cases it may be desirable to use a combination of automated and manual searching. For instance, a client might be offered a manual service for aspects of his subject not adequately covered by the chosen commercial service. Alternatively, the manual service might concentrate on types of document not retrieved by the commercial one: for example, a MEDLARS monthly search might be supplemented by manual indexing of books, reports and theses. More use will probably be made of broader based services, both internally produced bulletins and commercial services such as UKCIS macroprofiles.

The results of manual searches should be made available to as many users as possible. This is already being done within the university, where the subjects of profiles are listed in the *Library Newsletter*, and copies of the output are available on request. We are investigating the possibility of extending this system to other institutions, on the lines of a scheme recently proposed for commercial service profiles.[14]

Another possible development is some form of shared searching: for instance, the client assuming responsibility for core material, while library staff scanned fringe sources. This would require a fairly major change in attitude on the part of many of our clients: the library instruction programme could play an important part in encouraging such a change, particularly among research students. If it proves impossible in some cases to offer a service, either manual or commercial, we must aim at least to provide researchers with the necessary expertise to do the job for themselves, and this should mean not only initial instruction in sources and techniques but also ongoing assistance and support.

The second major factor to be considered in the development of the service is the question of client–librarian relations. So far, the service has suffered from a lack of sufficiently close contacts, and effort will have to be concentrated in this area, in order to increase client confidence and participation. As yet there has been no suggestion that the service should operate on a cost-recovery or cost-sharing basis. The only possible justification for such a system would be that it prevented irresponsible use of the service, and concentrated resources where they were most needed. However, we would regard the introduction of charges as an essentially retrograde step, and we hope that the problem of client motivation can be approached more positively by concentration on the building of better client–librarian relations.

Conclusion

No formal evaluation of the service has yet been undertaken, so our assessment of its success is based on our own observations. In our judgment, clients find the service valuable, and want it to continue. We believe that it meets an acknowledged need, in a way that clients find satisfactory, without placing an intolerable strain on those providing it, and without detracting from other library services.

Acknowledgement

The authors would like to thank the University Librarian, members of the library staff and clients for their approval, assistance and encouragement in forwarding this scheme.

The views expressed in this paper are those of the authors and not necessarily those of the University.

REFERENCES

1 LINE, M. B. Information services in university libraries. *J. Librarianship*, 1 (4), 1969, 211–24.
2 HALL, J. Information services in university libraries. *Aslib Proc.*, 24 (5), 1972, 293–302.
3 RHODES, R. G. *and* EVANS, A. J. The educational role of the university library and the provision of information services. *IATUL Proc.*, 7 (1) 1973, 11–25.
4 EVANS, S. M. Information services for the universities. *Aslib Proc.*, 25 (12), 1973, 484–90.
5 CORNEY, E. The information service in practice: an experiment at The City University Library. *J. Librarianship*, 1 (4), 1969, 225–35.
6 Personal communication from S. J. Teague, Librarian, The City University, 17 December 1973.
7 BATH UNIVERSITY OF TECHNOLOGY. University Library. Experimental information officer in the social sciences. *Report on work carried out in 1969.* February 1970.
8 BATH UNIVERSITY OF TECHNOLOGY. University Library. Experimental information service in the social sciences. *Report of work carried out in 1970.* January 1971.
9 BATH UNIVERSITY LIBRARY. Experimental information service in the social sciences, 1969–1971. *Final Report.* January 1972.
10 EVANS, S. M. *and* LINE, M. B. A personalized service to academic researchers: the experimental information service in the social sciences at the University of Bath. *J. Librarianship*, 5 (3), 1973, 214–32.
11 UNIVERSITY OF DURHAM. Project for evaluating the benefits from university libraries. *Final report.* October 1969. Chapter 7, A current awareness service for social scientists.
12 Personal communication from Mr Eric Cutter, University of Bradford Library, 28 March 1973.
13 AYRES, F. H. *The potential for information services in a university library: a report to OSTI.* March 1973.

14 The proposal for publicizing existing commercial profiles was made at the SCONUL Exchange of Experience Seminar on Information Services, University of Bradford, December 1973.

APPENDIX

Sample profiles

PROFILE E

1. Any references to Metoclopramide (= Maxolon, Primperan).
2. Role of the renin-angiotensin system with particular reference to the central nervous system.
    - (i) Effect on body fluids: drinking behaviour, release of antidiuretic hormone.
    - (ii) Cardiovascular effects: blood pressure, heart rate, cardiac output, blood flow, haemorrhage.
    - (iii) Production, distribution and destruction of angiotensin in the central nervous system.
3. Control and maintenance of normal and elevated blood pressure by a mechanism in the central nervous system.

Fortnightly lists. Foreign language material only if an English summary is available.

Sources

American Doctoral Dissertations
BLL Announcements Bulletin
British National Bibliography
Chemical Abstracts
Current Contents (Life Sciences)
Dissertation Abstracts International B
Index Medicus
Index to Theses (Aslib)

PROFILE J

Production scheduling and production control: case studies reporting experience and results in practical situations. Not theoretical studies, product costing or inventory control.

Sources

American Doctoral Dissertations
British National Bibliography
British Technology Index
Business Periodicals Index
Current Awareness Bulletin for Human Sciences and Management
Current Contents (Engineering and Technology)
Current Contents (Social and Behavioral Sciences)
Dissertation Abstracts International A and B
Engineering Index

Index to Theses (Aslib)
International Abstracts of Operations Research
Ismec Bulletin
Marketing and Distribution Abstracts (Anbar)
Operations Research/Management Science Abstracts
Top Management Abstracts (Anbar)

A list of resource material in Social Welfare

*Compiled by Aslib Social Sciences Group, Working Group on Information Needs in Social Welfare**

THE ASLIB SOCIAL SCIENCES GROUP has been discussing the problems of information and library services in social welfare since early 1970, at first through *ad hoc* groups of varying size and composition (librarians, information officers, social work researchers, practitioners and academics) and later through a formal Working Group, reporting to the main committee.

The main outcome of this Group has been much discussion, helping to clarify ideas (and to dispose of some) and bringing together a regular team of interested persons, if not experts. A second reaction has been to extend the knowledge of the Group by organizing two conferences. The first—a one-day conference held in March 1972—served to clarify different roles and functions of information services and identify where improvements could be most effective. From this the 'York Group' of Information Officers in Social Services evolved.

The second—a two-day seminar in October 1973—was a response by the Group to a plea from participants at the first conference for information on basic resource material in this field and how to use it.

Since the seminar there have been numerous requests for a listing of the sources used and these have now been gathered to form a checklist. It is not intended that this should be seen as a comprehensive list; the Group is anxious that it should be extended and altered if necessary. It hopes to produce a second edition from comments and suggestions made.

A list of selected journals in social work is also included.

I BASIC MINIMUM LIST

General reference

CITIZENS ADVICE NOTES (CANS). London, National Council of Social Service. Basic looseleaf volume plus updating supplements. £8.50 (basic set)+£4.50 per annum.

Digest of information kept up to date with supplements, covering a wide range of current legislation and administrative and industrial regulations. Arranged in broad subject sections, with comprehensive index.

SOCIAL SERVICES YEAR BOOK. London, Councils & Education Press. Annual. approx. 800 pp. £5.25.

Names, addresses, personnel listed for all local authorities—relevant social welfare departments, prison and probation service, hospitals, colleges and

---

* Any enquiries about the following list and the work of the Aslib Group in general are welcomed and should be made to the Secretary: Maureen Webley, Librarian, National Institute for Social Work, 5, Tavistock Place, London WC1H 9SS. Tel. 01 387 9681.

Aslib Proceedings, 27 (6), June 1975, p. 262–72. Printed in Great Britain

polytechnics, voluntary organizations, Department of Employment offices and related professional bodies. An extremely useful handbook.

WHITAKERS ALMANACK. London, Whitakers. Annual. approx. 1220 pp. £2.25. Very comprehensive general handbook found in all libraries and good for personal collections. Good index. Includes information on public affairs, government, industry, finance, commerce, social issues and the arts.

General guides to welfare services

WILLMOTT, P. Consumers guide to the social services. 3rd edition. Harmondsworth, Middx., Penguin Books, 1973. 330 pp. £0.50.

A very readable, comprehensive, practical guide, including chapters on services for children, the elderly, National Health Service, financial help and legal aid.

LYNES, TONY. Penguin guide to supplementary benefits. 3rd edition. Harmondsworth, Middx., Penguin Books, 1974. 325 pp. £0.45.

A comprehensive readable guide to supplementary benefits, including family incomes supplement and the appeals tribunal.

DEPARTMENT OF HEALTH AND SOCIAL SECURITY. Benefits guides and leaflets. From local DHSS offices. Irregular. Free.

Official guide leaflets to all welfare benefits, for the general public.

Current awareness/literature guides

DEPARTMENT OF HEALTH AND SOCIAL SECURITY LIBRARY. Current literature on personal social services. Monthly. Free.

Current literature on health services. Monthly. Free.

British and foreign articles, pamphlets and some books received in the DHSS Library. Items listed in subject groupings with brief annotations. Selected listing of circulars. Forms attached for prepayment photocopying service. The monthly bibliography 'General health topics' also includes some community health services material.

Government publications

HER MAJESTY'S STATIONERY OFFICE. Monthly catalogue. London, HMSO. £0.50 per annum.

Parliamentary papers listed in rather confusing sections but with classified list under issuing bodies. Index of names, titles, subjects.

HER MAJESTY'S STATIONERY OFFICE. Sectional lists. London, HMSO. Irregular. Free.

Check-lists of documents in print for given departments, *e.g.* no. 26—Home Office; no. 11—DHSS; no. 12—Medical Research Council.

Research and statistics

CLEARINGHOUSE FOR LOCAL AUTHORITY SOCIAL SERVICES RESEARCH. Birmingham, University of Birmingham, Department of Social Administration, P.O. Box 363, Birmingham B15 2TT. Monthly. £25.00 per annum.

This bulletin aims to publish any accounts of research from social service departments—pilot studies, questionnaires, bibliographies, to aid further research and development. Essential for local authority departments.

DEPARTMENT OF HEALTH AND SOCIAL SECURITY. Health and personal social services statistics for England (with summary tables for Great Britain). London, HMSO. Annual. approx. 176 pp. £3.00.

Salient statistics for health and closely related social services. Tables show trends over several years. Includes community health, psychiatric services, morbidity, personal social services.

SCOTTISH EDUCATION DEPARTMENT. Social Work Services Group. Scottish social work statistics. London, HMSO. Annual. approx. 112 pp. £1.20.

WELSH OFFICE. Health and personal social services statistics for Wales. Cardiff, HMSO. Annual. approx 130 pp. £2.15.

2 CHECK LIST FOR LARGER COLLECTIONS

General reference

NATIONAL ASSOCIATION OF SOCIAL WORKERS. Encyclopedia of social work. 2 vols. New York, National Association of Social Workers, 1971. 1645 pp. approx. £12.00.

180 commissioned articles on all aspects of social work practice. A rather American bias, particularly in sections on administration of services and financing. An extremely useful tome for general orientation and background references. Revised every five years. Previously published as the Social Work Year Book.

NATIONAL ASSOCIATION OF SOCIAL WORKERS. *Abstracts for Social Workers.* New York, National Association of Social Workers. Quarterly. £13.14 per annum.

A quarterly abstracting journal covering the American literature well, but with limited coverage of British material and a year time lag. Cumulative author and subject index.

CLEGG, J. *compiler.* Dictionary of social services. Policy and practice. London, Bedford Square Press, 1971. 126 pp. £0.90.

LORENZI, A. Glossary of social work terms in English–French–German. Berlin, Carl Heymann Verlag KG, 1956. 172 pp.

Compiled originally for an international conference; now a little dated but useful for translations.

Directories

CHARITIES DIGEST. London, Butterworths for the Family Welfare Association. Annual. approx. 469 pp. £1.80.

Comprehensive listing of charitable trusts and associations plus details of related social welfare organizations.

HOSPITALS AND HEALTH SERVICES YEARBOOK. London, Institute of Health Service Administrators. Annual. approx. 1310 pp. approx. £9.85.

Complete directory of all NHS hospitals, hospital authorities with addresses and senior personnel. Brief statistics and sections of other relevant health service information. 1974 edition contains full details of reorganization. Directory of hospital suppliers.

MUNICIPAL YEARBOOK AND PUBLIC SERVICES DIRECTORY. London, Municipal Journal Ltd. Annual. approx. 1924 pp. approx. £10.00.

In three sections: I. Introduction, indexes and statistics. II. General information on certain subjects. III. Complete guide to all local authorities in Great Britain and Northern Ireland.

DEPARTMENT OF THE ENVIRONMENT. Local government in England and Wales. A guide to the new system. London, HMSO, 1974. 280 pp. + maps. £4.00.

A clear guide including the names, status, populations, chief executives, electoral arrangements etc.

NATIONAL ASSOCIATION FOR THE CARE AND RESETTLEMENT OF OFFENDERS. Manual and directory. London, NACRO, 1974. 300 pp. £1.00.

Gives information about services available for those working or interested in crime prevention and the care of offenders. Includes details of over 100 projects working with people at risk in the community.

NATIONAL ASSOCIATION OF PROBATION OFFICERS. Probation directory. London, Owen Wells, 1974. 96 pp. £1.60.

Complete list of all probation offices, officers, prisons, borstals, detention and remand centres in England and Wales, based on the new local government areas.

NATIONAL CHILDREN'S BUREAU. Directory of voluntary organizations concerned with children. London, Longman for the National Children's Bureau, 1969. 200 pp. £3.00.

NATIONAL COUNCIL OF SOCIAL SERVICE. Directory of grant-making trusts. London, Charities Aid Fund of the NCSS, 1974. 920 pp. £7.50.

An alphabetical register of grant-making trusts with classified indexes.

ROBERTS, I. *compiler*. A handbook of organizations, relating to health and social services. London, Health and Social Service Journal Ltd., 1973. 46 pp. £0.20.

Short but useful alphabetical listing of organizations with addresses and brief guide to activities. Slight medical bias.

ROYAL NATIONAL INSTITUTE FOR THE BLIND. Directory of agencies for the blind. Revised edition. London, RNIB, 1973. £1.25.

YEARBOOK OF YOUTH SERVICE IN ENGLAND AND WALES. Leicester, National Youth Bureau. Annual. 954 pp. £4.00.

Addresses, personnel, aims of national voluntary youth organizations, training establishments, local authority youth services, national liaison bodies. Annotations of current developments and review of the year.

Research

DEPARTMENT OF EDUCATION AND SCIENCE. Scientific research in British universi-

ties and colleges, including government departments and other institutions. 3 volumes. London, HMSO. Annual. (Vol. 3—Social sciences.) 806 pp. £6.50.
Projects listed under broad subject headings, with alphabetical index of units, organizations and people.

DEPARTMENT OF HEALTH AND SOCIAL SECURITY. Annual report. London, HMSO. approx. 183 pp. £1.20.
Current activities of the Department including some research.

DEPARTMENT OF HEALTH AND SOCIAL SECURITY. Annual report on Departmental research and development. London, HMSO. Annual. 88 pp. £0.80.

DEPARTMENT OF HEALTH AND SOCIAL SECURITY. Chronically Sick and Disabled Persons Act 1970. Research and development on equipment for the disabled London, HMSO. Annual. 18 pp. £0.20.

DINNAGE, R. The handicapped child: a research review. Volumes 1, 2, 3. London, Longman for the National Children's Bureau, 1970, 1972, 1973. 366 pp; 451 pp; 651 pp. £2.75; £3.30; £6.50.

HOME OFFICE. Research Unit. Summary of research within the Unit and of research supported by grant. London, Home Office (Romney House). Irregular. approx. 50 pp. Free.

MCLACHLAN, G. *editor*. Portfolio for health 2: the developing programme of the DHSS in health services research. London, Oxford University Press for Nuffield Provincial Hospitals Trust, 1973. 463 pp. £6.50.
Articles about current research programmes, plus list of current activities and details of DHSS-promoted research and development in 1972/73. (This list also available separately—£2.00.) 'Portfolio for health 1' appeared in 1971.

NATIONAL CORPORATION FOR THE CARE OF OLD PEOPLE. Old age: a register of social research 1955–72. London, National Corporation for the Care of Old People, 1972. 148 pp.+looseleaf supplements, 1972. £2.50.
Full details of research projects, grouped by type of organization, *e.g.* universities, local authorities, independent organizations.

SOCIAL SCIENCE RESEARCH COUNCIL. Research supported by the SSRC. London, SSRC. Annual. 318 pp. £0.90.
Also quarterly Newsletters (free) containing news, notes, completed research and recent grants.

Guides to social welfare services

CENTRAL OFFICE OF INFORMATION. Social services in Britain. London, HMSO, 1973. 117 pp. £0.73.
Comprehensive official guide, including education and supplementary benefits. Similar information pamphlets for 'Care of the elderly' and 'Social security'.

DISABLEMENT INCOME GROUP. An ABC of services and central information for disabled people. 2nd edition. London, DIG, 1974. 40 pp. £0.30.

FAMILY WELFARE ASSOCIATION. Guide to the social services. London, Macdonald & Evans for the FWA. Annual. 325 pp. £0.85.
Information regarding statutory and voluntary services, legislative procedures, in classified sections. Index.

MATTHEWS, G. Knowhere to go: social services for the single homeless. Canterbury, Kent, The Cyrenians, 1974. 130 pp. £0.80.
Sections on supplementary benefits, the law affecting homeless individuals and hostels, medical services, accommodation, specialized agencies. Besides listing, suggests action to improve them.

WILLMOTT, P. *editor*. Public social services. Handbook of information. London, Bedford Square Press for the National Council of Social Service, 1973. 201 pp. £1.25.
Aims to provide for all those working in social services a compact account of official services with particular reference to legislation. Subject index.

General surveys and guides to the literature

FORDER, A. *editor*. Penelope Hall's modern social services in England and Wales. 8th edition. London, Routledge & Kegan Paul, 1971. 324 pp. £1.75.
Useful basic volume to trace development of services, but now out of date.

JONES, DAVID *and* MAYO, M. *editors*. Community work: One. London, Routledge & Kegan Paul, 1974. 260 pp. £3.00.
Annual survey of the development of community work in different settings. Contributors include researchers, academics and fieldworkers.

JONES, K. *editor*. The yearbook of social policy in Britain. London, Routledge & Kegan Paul. Annual (1971–) approx. 250 pp. approx. £5.00.
Brings together papers on issues which were actively discussed during the year covered and analyses a prominent theme.

NATIONAL CHILDREN'S BUREAU. Facts and fallacies series.

1. Residential child care. By R. Dinnage and M. Kellmer Pringle. London, Longman for the NCB, 1967. 344 pp. £1.50.
2. Foster home care. By R. Dinnage and M. Kellmer Pringle. London, Longman for NCB, 1967. 268 pp. £1.85.

Very useful source books, but now a little out of date.

NATIONAL CHILDREN'S BUREAU. Spotlight series. No. 4. Sources of information about children. London, NCB, 1974. 30 pp. Free.
This pamphlet lists under 15 subject headings, statistical and general sources of specific information about children.

WRIGHT, MARTIN *editor*. Use of criminology literature. London, Butterworths, 1974. 242 pp. £5.50.
An extremely useful guide, including official publications and chapters by subject specialists.

Law and legal rights

BEVAN, H. K. The law relating to children. London, Butterworths, 1973. 522 pp. £6.00.

CENTRAL COUNCIL FOR EDUCATION AND TRAINING IN SOCIAL WORK. Social work curriculum study. Legal studies in social work education. (Paper no. 4.) London, CCETSW, 1974. 63 pp. £0.75.

Appendix B—The social worker's professional law.

COOTE, A. *and* GRANT, L. *editors*. Civil liberty: the N.C.C.L. guide. 2nd edition. Harmondsworth, Mddx., Penguin Books, 1973. 356 pp. £0.50.

Aims to explain legal rights and ways of putting them into practice, and highlights aspects of British law which adversely affects civil liberties.

EDWARDS, A. H. Mental health services. 3rd edition. London, Shaw, 1961. 742 pp. (New edition in preparation.) £5.25.

Comprehensive guide and listing of legislation.

GOODMAN, L. Clarke Hall and Morrison's law relating to children and young persons. 8th edition. London, Butterworths, 1972. 1366 pp. £12.00.

Supplements issued periodically until the edition is superseded. A mine of information in 5 sections about children, the law and their rights, welfare and education.

SHELTER. Housing rights handbook. By Marion Cutting. London, Shelter, 1974. 155 pp. £0.60.

Very clear account of housing legislation, tenants rights, squatting, eviction, local authority obligations.

SMITH, N. J. A brief guide to social legislation. London, Methuen, 1972. 190 pp. £0.85 pa.

An excellent guide to legislation in social welfare in broad subject groupings, with chronological index of reports mentioned.

WATKIN, B. Documents on health and social services: 1834 to the present day. London, Methuen, 1975. 512 pp. £8.75.

Surveys the whole range of modern social legislation from the Poor Law to 1973 National Health Service Act.

ZANDER, M. Social workers, their clients and the law. London, Sweet & Maxwell, 1974. 122 pp. £3.00.

A readable guide to legal problems which social workers may encounter such as housing, divorce, welfare benefits.

Statistics

General

CENTRAL STATISTICAL OFFICE. List of principal statistical series and publications London, HMSO, 1972. 42 pp. £0.47.

Very useful reference list, in subject groupings, with alphabetical listing of all publications referred to, and a subject index.

CENTRAL STATISTICAL OFFICE. Annual abstract of statistics. London, HMSO. Annual. approx. 425 pp. £2.20.

The best guide for very general statistics.

CENTRAL STATISTICAL OFFICE. Facts in focus. London, HMSO in conjunction with Penguin, 1974. 222 pp. £0.50.

Very general tables in broad subject groupings.

Specialist

CENTRAL STATISTICAL OFFICE. Social trends. London, HMSO. Annual. approx. 241 pp. £3.30.

Several survey-type articles plus statistics in subject groupings including health and personal social services, education, housing, environment, resources.

CHARTERED INSTITUTE OF PUBLIC FINANCE AND ACCOUNTANCY. Local health and social services statistics. London, CIPFA. Annual. 72 pp. £2.00.

Information about expenditure on health and social services for all local authorities.

EDWARDS, B. Sources of social statistics. London, Heinemann, 1974. 276 pp. £2.10.

Good general introduction. Sections on population, health and welfare, housing, education, crime and justice.

GREAT BRITAIN. Health and welfare. The development of community care. Revision to 1975–76 of plans for the health and welfare services of the local authorities in England and Wales. Cmnd. 3022. London, HMSO, 1966. 422 pp. £1.87½.

Summary and analysed figures for 10-year plans submitted to DHSS; useful information for forward planning.

DEPARTMENT OF HEALTH AND SOCIAL SECURITY. Statistics and Research Division. Local authority social services statistics. London, DHSS. Irregular. Free.

A variety of separate statistical tabulations—feedback tables from latest local authority statistical returns.

DEPARTMENT OF HEALTH AND SOCIAL SECURITY. A guide to health and social services statistics. London, DHSS, 1974. 38 pp. Free.

A listing and guide to the above feedback statistics plus certain demographic and social statistics published by DHSS and other departments; intended as a source of reference for social service departments to assist in planning, monitoring and evaluation.

DEPARTMENT OF HEALTH AND SOCIAL SECURITY. Social security statistics. London, HMSO. approx. 222 pp. Annual. £3.65.

Tables grouped in sections according to benefit or subjects.

DEPARTMENT OF HEALTH AND SOCIAL SECURITY, and Welsh Office. Children in care in England and Wales. London, HMSO. Annual. approx. 15 pp. £0.24.

Statistical summary and brief report.

HOME OFFICE. Criminal statistics, England and Wales. London, HMSO. Annual. approx. 241 pp. £1.85.

MAUNDER, W. F. *editor*. Reviews of United Kingdom statistical sources. Vol. 1. Personal social services, by B. Davies. Voluntary organizations in the personal social service field, by G. J. Murray. London, Heinemann Educational, 1974. 54 pp. £3.25.

A series sponsored by the Royal Statistical Society and the Social Science Research Council aiming to give detailed guidance on what data are available, and where, on certain topics. Subject index to text and quick reference list of items mentioned.

3 SOCIAL WORK JOURNALS

The following list is selected and intended to be a general guide. There are many other periodicals on housing, criminology, medicine, and planning which are relevant; the constantly changing boundaries of the social welfare field make choice difficult. The periodicals listed are felt to make some significant contribution to the field, but many voluntary organizations and pressure groups produce other excellent newsletters and magazines.

ABSTRACTS FOR SOCIAL WORKERS. National Association of Social Workers, 49 Sheridan Avenue, Albany, New York 12210. (Q) £13.14.

ASSOCIATION OF COMMUNITY WORKERS, Newsletter, 117 Fairholme Road, Benwell, Newcastle upon Tyne NE4 8AS. (Irreg.)

BRITISH JOURNAL OF CRIMINOLOGY. Stevens & Sons Ltd., 11 New Fetter Lane, EC4. (Q) £5.25.

BRITISH JOURNAL OF SOCIAL WORK. British Association of Social Workers, 16 Kent Street, Birmingham B5 6RD. (Q) £10.00.

BRITISH JOURNAL OF SOCIOLOGY. Routledge & Kegan Paul Ltd., 68–74 Carter Lane, London EC4V 4EL. (Q) £7.50.

CHILD ADOPTION. Association of British Adoption Agencies, 27 Queen Anne's Gate, London SW1. (3 pa) £1.60.

CHILD CARE, HEALTH & DEVELOPMENT. Blackwell Scientific Publications, Osney Mead, Oxford. (BiM) £10.00.

CLEARINGHOUSE FOR LOCAL AUTHORITY. SOCIAL SERVICES RESEARCH, BULLETIN, University of Birmingham, P.O. Box 363, Birmingham B15 2TT. (M) £25.00.

CLINICAL SOCIAL WORK. Behavioural Publications, 72 5th Avenue, New York, N.Y. 10011. (Q) £14.77.

COMMUNITY ACTION. 7a Frederick Mews, Kinnerton Street, London SW1. (BiM) £1.50.

COMMUNITY CARE. Dorset House, Stamford Street, London SE1 9LU. (W) £7.80 (free to profession).

COMMUNITY DEVELOPMENT JOURNAL. Oxford University Press, Press Road, Neasden, London NW10. (Q) £4.00.

COMMUNITY SCHOOLS GAZETTE. Northbrook School, Beacon Lane, Exeter EX4 8NA. (M) £2.00.

FOCUS. 19 Claremont Crescent, Edinburgh EH7 4QD. (M) £3.00.

HEALTH & SOCIAL SERVICE JOURNAL. 27–29 Furnival Street, London EC4A 1JR. (W) £8.50.

HOWARD JOURNAL OF PENOLOGY. Howard League for Penal Reform, Butterworth & Co. (Publishers) Ltd., 88 Kingsway, London WC2B 6AB. (A) £2.00.

INTERNATIONAL JOURNAL OF OFFENDER THERAPY. 199 Gloucester Place, London NW1 (3 pa) £5.00.

INTERNATIONAL SOCIAL WORK. International Council on Social Welfare, 345 East 46th Street, New York, N.Y. 10017. (Q) £4.15.

JOURNAL OF EDUCATION FOR SOCIAL WORK (& SOCIAL WORK EDUCATION REPORTER). Council on Social Work Education, 345 East 46th Street, New York, N.Y. 10017. (3 pa) £8.00.

JOURNAL OF SOCIAL POLICY. Cambridge University Press, P.O. Box 92, London NW1. (Q) £10.00.

LONDON COUNCIL OF SOCIAL SERVICE INFORMATION BULLETIN. 68 Chalton Street, NW1 1JR. (M) £4.00.

MUNICIPAL JOURNAL. 3 Clement's Inn, London WC2A 2DB. (W) £7.00.

NEMESIS. Women's Aid, 369 Chiswick High Road, London, W4. (M) £2.50.

NEW SOCIETY. 128 Long Acre, London WC2E 9QM. (W) £8.00.

PARLIAMENT & SOCIAL WORK. British Association of Social Workers (W) £3.00.

POLICY & POLITICS. Macmillan Journals Ltd., Little Essex Street, London WC2. (Q) £8.50.

POVERTY. Child Poverty Action Group, 1 Macklin Street, London WC2B 5NH. (Newsletter, pamphts) (Irreg.) £5.00.

PRISON SERVICE JOURNAL. H.M.S.O., 49 High Holborn, London WC1. (Q) £0.35.

PROBATION. National Association of Probation Officers, 6 Endsleigh Street, London WC1H 0DZ. (3 pa) £1.10.

PUBLIC ADMINISTRATION. Royal Institute of Public Admin., Hamilton House, Mabledon Place, London WC1. (Q) £5.00.

RESIDENTIAL SOCIAL WORK. Residential Care Association, Health & Social Service Journal, 27–29 Furnival Street, London EC4A 1JR (M) £3.50.

SMITH COLLEGE STUDIES IN SOCIAL WORK. Smith College School for Social Work, Northampton, Massachusetts 01060. (3 pa) £3.45.

SOCIAL & ECONOMIC ADMINISTRATION. University of Exeter, Northcote House, The Queens Drive, Exeter EX4 4JQ. (Q) £4.50.

SOCIAL CASEWORK. Family Service Association of America, 44 East 23rd Street, New York, N.Y. 10010. (M) £6.62.

SOCIAL SERVICE QUARTERLY. National Council of Social Service, 26 Bedford Square, London WC1B 3HU. (Q) £1.60.

SOCIAL SERVICE REVIEW. University of Chicago Press, 5801 Ellis Avenue, Illinois 60637. (Q) £6.51.

SOCIAL WORK New York. National Association of Social Workers, 49 Sheridan Avenue, Albany N.Y. 12210. (Q) £8.80.

SOCIAL WORK SERVICE. Dept. of Health & Social Security, Rm. 154, Horseferry House, Dean Ryle Street, London SW1. (3 pa) Free.

SOCIAL WORK TODAY. British Association of Social Workers. (BiM) £8.00.

SOCIOLOGICAL REVIEW. University of Keele, Staffordshire ST5 5BG. (Q) £3.00.

YOUTH SOCIAL WORK. National Youth Bureau, 37 Belvoir Street, Leicester. (BiM) £1.00.

A Survey of British Practice in Co-ordinate Indexing in Information/Library Units

D. J. Campbell

Price: £5.25
£6.50 to Aslib members

SBN: 85142 066 4

3 Belgrave Square London SW1X 8PL

Aslib Publications

Technical Note

Time-Factor classification

R. Moss

Teesside Polytechnic

Abstract

Orthodox library classification and cataloguing imply continuing and indefinite expansion of libraries and their buildings. This is no longer feasible. But 'weeding' of stocks is slow and labour-costly. However, a simple subsidiary classification by year—'Time-Factor'—recorded on both book and catalogue entry will enable subsequent relegation of books to store to be made without any catalogue amendment. Relegation periods can be varied for different subjects.
The method offers opportunities of devising regional, specialist and national storage policies for libraries.

THERE IS A Parkinson's Law of libraries—'Book stock expands to fill the space available'. To an outside observer, it seemed that no sooner had new universities been created and libraries built than the librarians were reporting that their shelves were already full—in some cases before they were built. The situation seems now to be repeating itself in some Polytechnics. The stock continues to increase. Library space remains static. Librarians struggle to make their buildings as large as possible and financial administrators struggle to keep building costs down.

No matter how large or small the building is, there must always be some limit to its capacity. Library planning has, therefore, to face the paradox that large and generally ever-increasing inputs to the bookstock are poured in to fixed capacity buildings. Many large and well-established libraries already find themselves in this situation. Newer ones have some opportunity to try and avoid it.

The usual and obvious answer to the problem of full and overfull libraries is to 'weed' the bookshelves, to remove books deemed to be obsolete or inadequately used from them. Like all gardening, however, weeding is too much like hard work; therefore, something to be avoided by civilized man. While it is understandable that librarians wish to display all their book wares in open access arrangement, we have now reached the stage when complete display of all stocks for all time in any particular library is no longer feasible. No multiple store can hope to put everything in its shop window. Equally, no library can now display everything it has once bought on its own shelves forever.

One of the reasons why librarians are reluctant to discard books is that, although it is simple to throw the book itself into the wastepaper basket, the subsequent amendment of catalogue records takes much longer. This is an inevitable fault of multiple record card indexes. At present discarding and

Aslib Proceedings, 27 (6), June 1975, p. 273–77. Printed in Great Britain

relegation (*i.e.* transfer to store) involve considerable effort in modifying catalogue records at the time of transfer. A little rethinking of accepted orthodoxies is necessary to make cataloguing and classification routines more suitable for an age of mass publication and consequent rapid obsolescence than for the leisurely nineteenth-century library browsing which is all they were designed to cope with.[1]

Weeding implies that a book is thrown away. There is, however, an alternative to complete discarding or destruction and that is transfer or relegation of obsolescent material to a library store. For the present, it will be assumed that the library possesses or intends to earmark part of its space for a store. Obviously, there are also possibilities of storage shared between several libraries. Till now, however, library stores have generally been the result of inadequate space in the original library buildings rather than an integral part of planning and processing policies.

Future policy envisages, first, a main Library of finite size for shelving of 'new' stocks and, secondly, a store for 'old' obsolescent material. Relegation to store can take place after a suitable sojourn on the shelves of the main library.

Time-factor method

The key to the administrative simplicity of the method—here called 'Time-Factor' classification for want of a better name—is to mark both the spine of the book and also the corresponding catalogue cards with a time symbol. As with class numbers, the year number on the catalogue cards will always coincide with that on the spine of the book. The date or year is that in which the book is catalogued on receipt. It is unlikely that there will ever be any need to specify date or time more precisely than to a particular year. In most educational libraries, relegation to store will almost certainly take place during the summer vacation which marks the break between academic years. Thus, it is adequate to show the Time-Factor merely by the year. This in turn can almost certainly be reduced to its last two figures; such a code will last a century.

The method was originally devised and put into operation at University College, Cork, Ireland. There the situation was that a small and badly overcrowded library, though one with a fair-sized book stock, had some possibility of easing its chronic space problem by moving a large part of its earlier stock into a former warehouse. The college had been established over a century and a large part of the stock was not merely obsolescent but obsolete. Relegation presented no problems. The problem was how best to determine what went there in the future. It seemed that 'Time-Factor' offered certainly a more economical and generally more efficient if less selective method than any alternative one involving weeding of individual books.

At UCC, the year figures directly followed the class number, being generally placed below it both on book spine and catalogue cards. At Teesside Polytechnic, where 'Time-Factor' has also now been adopted, a 3-letter code representing the first three letters of the author's name is also placed between class number and year. This is not essential, however, and this intermediate author code may eventually be discarded. It does, however, give a neat format for easy identification, both on book and card. For example:

301	547.13
CAL	JOH
74	74

Determination of relegation date

The year shown is that of the book's accession to the library. Obviously, alternative methods of dating, namely by year of publication or by future year in which a book is to be transferred to store, are also possible. These alternatives were considered and rejected—publication dates can span too wide a period: a work from an earlier century coming into the library would find itself already due for relegation even before it had been on the main shelves; likewise, attempting to forecast the life span of display on main shelves from the start and putting the future year of transfer on book and cards would be too hazardous; it would mean, in view of the labour of changing dates on book spines and cards, that there was virtually no chance of revising the original 'guesstimate' as to length of sojourn on main shelves.

Making date of accession the controlling factor gives an administrative flexibility not easily afforded by the other two methods. The immediate advantage is that, if desired, one can adopt varying periods of residence on main shelves for different classes of books. In the physical sciences, for example, obsolescence is comparatively rapid: a standard sojourn for ten years or even less could be adopted. In History, a subject which by its very nature takes nostalgic glances backwards, twenty-five years might not be excessive. Specifying year of accession as the determining factor means that one avoids having to guess the ideal 'new shelf' sojourn in the early stages of operation; it also means that there are no unnecessary complications created by having original editions of literary works dating from years, or centuries past, coming 'new' into the library. From the point of view of library administration, the virtue of the method is that at the time of relegation no further work has to be done on amending catalogue records. Where computerized catalogues are in use, it should be possible to get print-outs of those books to be relegated in any particular year done easily and rapidly. Where libraries—still the majority—rely on the orthodox catalogue card indexes it is a comparatively easy task to go along the shelves and pull out books due for relegation.

It is not intended that this method should replace some form of shelf classification by subject. This still takes priority. However, it is likely that the existence of a sub-file by date within each class number would mean that the main classes could be much larger and that schedules could be correspondingly simpler. There could then be, if not an end to, at any rate less argument and time lost by hair-splitting over detailed library classification, a technique whose disadvantages in an age of mass publication are now beginning to outweigh the advantages. Broader classification offers better possibilities in educational establishment libraries of classification being associated largely with the department which ordered the book. This seems to be the only way in educational and special libraries of avoiding the endless arguments with academic and research staff as to reasons why 'their' books are not on 'their' shelves—a cross which most public libraries do not have to bear.

Advantages to readers

So far, relegation to store has been considered only from the point of view of library administration. It is believed, however, that this policy will also have considerable advantages from the readers' and users' points of view. One major disadvantage of orthodox library classification is that there is no provision for obsolescence. Books and subjects, and the interest in them, are presumed to remain static for all time. The result is that, unless shelves are weeded regularly, the newer and recent material is cluttered up with a great deal of old and obsolescent material—or what is currently regarded as obsolescent, since fashions change as much in reading and teaching as in female apparel and male motor cars.

Comment and future developments

The method does not claim to be as refined as individual weeding of books. But such individual treatment is increasingly costly and most libraries have reached the stage where they can no longer afford it. Also, with individual weeding, each previously unweeded book has to come up time and time again for reconsideration at each fresh weeding. In fact, are not libraries dealing with the weeding problem by not even attempting it? By trying to get bigger buildings all the time, rather than by discarding stock?

It is apparent that the crucial factor in the success of 'Time-Factor' is the length of sojourn on the main shelves. Too long, and much of its benefit will be lost; too little, and there will be excessive labour and user inconvenience in repeatedly bringing some books back from store. However, the library can always vary the residence times on main shelves for different classes. It is here that research is needed to find the optimum sojourn for different subjects. There is also always the ability to re-assess residence times for individual books in heavy demand over long periods, as for instance, where lecturers continue to recommend the same texts long after they have been superseded—or is this being too cynical?

One area in which some form of 'Time-Factor' is essential is in that of adjusting an established library and its classification to changes in classification schedules made in a centrally provided scheme as, for example, in the successive editions of Dewey. How many libraries can alter their classification, shelf-arrangement, subject indexes and relevant spine numbers every time a new edition of a classification is produced? This will become an increasingly pressing problem as libraries try to use centrally allocated class numbers from MARC tapes. Already, different editions of classification schedules are introducing a time-element. It may well be that 'Time-Factor' could eventually be phased in with these, and it is perhaps in this direction that one of its most useful possibilities lies.

One incidental advantage of relegation to a store in or near one's own library is that such a store can be virtually closed-access and thus use can be monitored much more closely than in an open-access library.

Regional and national storage policy

So far, it has been assumed that the library has had its own store. Eventually that, too, will be full. However, there is no need to confine oneself to one store. The overall pattern of library policy is changing. A national lending library dealing mainly with lending of back issues of periodicals has been in existence for over 15 years. With the advent of the British Library and the incorporation of the lending side in this same organization, and above all with the pressures of an adverse economic situation, there is bound to be some questioning as to how long libraries can go on storing copies of books indefinitely. Does the fact that Professor X, distinguished but long defunct, ordered a book in 19XX justify its occupying shelf space indefinitely? Libraries are already accepting a situation in which a measurable proportion of their borrowing is being made not from their own but from other libraries. Inevitably, this will increase.

It is possible, therefore, to envisage a situation where a library can dispense with its own store altogether. It could discard its obsolescent books completely after a certain residence time, relying thereafter for those particular items on the national or other lending stores. Alternatively, a compromise arrangement could be to have additional regional or specialist stores for selected material rather than to rely solely on one central store.

Inevitably, such major changes of policy must have some effect on the employment position in libraries. Those who are concerned with this should be considering that problem now.

Research

Obviously, the crucial factor is to determine optimum sojourn or residence times on main shelves. Since this can be varied for different subjects it is desirable to have some facts and figures to work on rather than just take a blind guess.

Accordingly, thanks to the assistance of the Senior Library Adviser to DES and the Office for Scientific and Technical Information (now British Library, Research and Development Department), the Cambridge Library Management Research Unit, which had already been examining the 'weeding' problem,[2] was asked to conduct a preliminary survey and to devise a suitable test methodology. Although the results obtained so far will be of interest only to Teesside Polytechnic, it is believed that the methodology devised by the CLMRU will be of general interest and usefulness to other libraries wishing to conduct surveys of use. It is hoped that the Unit will be reporting further results and their methodology in a subsequent paper.

REFERENCES

1 MOSS, R. The basic weakness of Library Classification. *An Leabharlann: Journal of the Library Association of Ireland,* 29, December 1971, p. 83–5.

2 SEYMOUR, CAROL A. Weeding the collection: a review of research on identifying obsolete stock. Part 1: Monographs. *Libri,* 22 (5) 1972, p. 137–48.

Letter to the Editor

Sir,

THE CURRENCY OF COMPENDEX

COMPENDEX—COMPuterized ENgineering inDEX—is the tape version of the printed monthly editions of Engineering Index (EI) which provides SDI or retrospective search services. Two years ago we reported on an OSTI project[1] in which we evaluated the responses of 89 engineers to a one-year free trial run of the SDI service from COMPENDEX. In the final questionnaire to the users we sought to elicit their views on various aspects of the service, including what they regarded as its advantages and its defects. Of the criticisms made of COMPENDEX at that time the strongest was that too many of the references were out of date.

The managers of EI took note of this criticism. We subsequently learned that, during the period of our evaluation of the SDI service, the EI system was being prepared for conversion from a partially manual to a fully computerized system. The managers of EI hoped that this conversion would make it possible to improve the currency of the output from COMPENDEX and we decided that we should later re-estimate the currency to see whether the expected improvement had in fact occurred. We are pleased to report that the currency of COMPENDEX has much improved with the introduction of the new system.

A comparative test

We appreciated that it might take some months for the new system to run smoothly and to retract its tail of long-delayed entries. We therefore decided to wait for one year before re-testing the currency. A further period was needed to check all the items selected for test in order to be sure that any delay could be fully measured.

The fully mechanized system of EI began to operate in November 1973. We have compared random samples taken from EI, November 1971, and from EI, November 1973. The samples were obtained by selecting items at equal intervals from the printed lists and constituted about 1/70 of the total list in both cases. The 1971 sample, of 107 items, was found to have a mean delay of 419 days whereas the 1973 sample, of 55 items, was found to have a mean delay of 141 days. The new system had therefore already reduced the mean delay to about 1/3 of the delay our users complained of.

The delay was measured as the number of days between the data of the availability of the original to *users in the UK*, as indicated by the date of accession of the periodical by the Science Reference Library, and the date of availability of the abstract. A negative delay indicates that the abstract was available before the original. The negative delays are relatively few.

The difference between the currencies of the two samples is displayed in Figure 1. The difference is statistically highly significant on any test.

In view of the wide criticisms of the currency of the COMPENDEX service

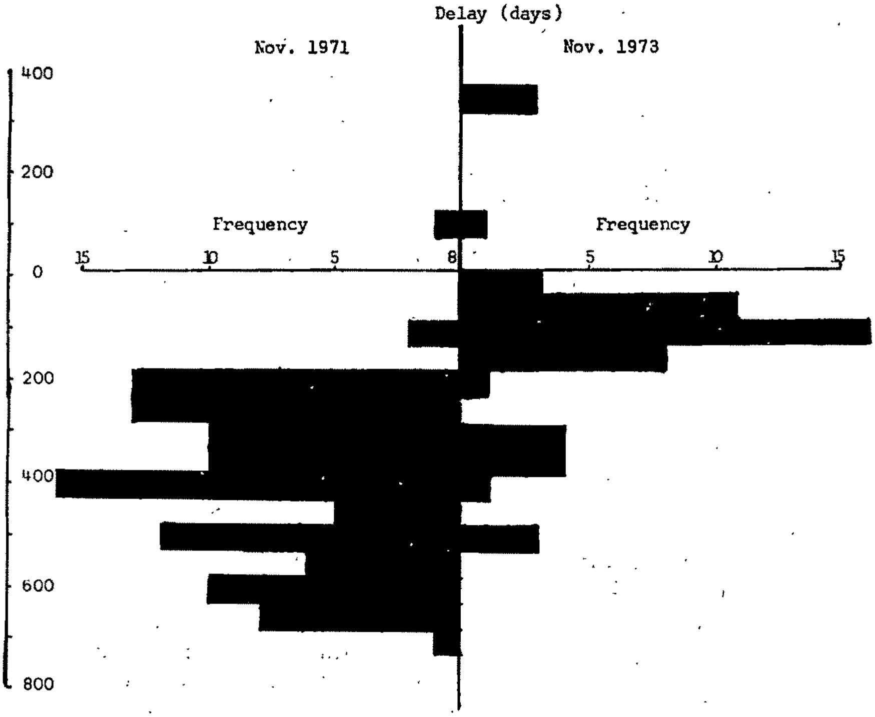


FIGURE 1: *Currency of COMPENDEX: Nov. 1971* v. *Nov. 1973*

made during our evaluation project, we felt that this marked improvement should be publicly reported in the UK.

Yours faithfully,

B. C. BROOKES
A. PRESANIS
School of Library Archive and Information Studies, University College London

REFERENCE

1 PRESANIS, A. *and* BROOKES, B. C. COMPENDEX evaluation project. OSTI Report (1973).

BRIEF REVIEWS

FISK, M. *ed.* Encyclopedia of associations: a guide to national and international organizations; vol. 1, National organizations of the US; vol. 2, Geographic and executive index; vol. 3, New associations and projects (quarterly). 9th ed. Detroit, Mich., Gale, 1975. 1,413 pp. $55. (ISBN 0 8103 0126 1) (vol. 1); 736 pp. $38. (ISBN 0 8103 0131 8) (vol. 2); $48. (ISBN 0 8103 0130 X) (vol. 3).

Generally it has been possible to report improvements with each new edition of *Encyclopedia of associations* and this ninth edition is no exception. First published in 1956 this reference tool has had its coverage extended over the years to include not only national non-profit membership organizations but also selected non-membership groups, foreign organizations of American interest, international organizations with large American memberships, local or regional groups of national interest and citizen action groups. These organizations are listed alphabetically by keyword in Volume 1 within seventeen divisions. Two final sections list 'inactive or defunct' and 'missing' organizations.

One of the major changes in this edition is the introduction of the numbering of each entry which facilitates the locating of the entry required, after consulting the alphabetical and keyword index. Users of the 8th edition (1973) will be pleased to note that the index in the 9th edition is in a more legible typeface, as indeed is the whole of the volume, headings within each entry, for example Founded, Members, Staff, Publications, Convention/Meeting, being in boldface type. Besides the information given under such headings the address, acronym and the name of the chief executive is given. While legibility is a consideration in buying a new edition of this reference work, it is likely that the publisher's claim of 20,000 changes in existing entries in addition to 1,255 brand new listings is a rather more relevant factor. A total of 14,563 organizations are listed altogether, former names of organizations having been taken into the main entry in this edition. In Volume 2, Section 1, names and addresses of organizations are listed alphabetically under towns in each state. The second section lists alphabetically the executives named in the main entries, with full addresses of the organizations.

Information on new organizations is given in the quarterly publication *New associations and projects.* The basic format used in Volume 1 is followed with numbered main entries and an alphabetical and keyword index. The first supplement lists details of 254 newly notified organizations.

This reference work is a mine of useful information. Those involved in tracing information on American associations will certainly feel it necessary to invest in a copy of Volume 1. Volume 2 is probably principally of interest to the North American market. If contemplating a subscription to Volume 3 it may be relevant to consider that approximately 18 months elapsed between the publication of the 8th and 9th editions.

FARNFIELD, C. A. *ed.* A Guide to sources of information in the Textile Industry. Second Edition. Manchester, The Textile Institute, 1974. 130 pp. £3.20 (ISBN 0 900739 06 1).

There is a limit to the directly applicable intelligence that can be accommodated in 130 pages. But when, as in the book under review (of which the first edition was published in conjunction with *Aslib*), the pages are packed instead with details of textile books and bodies from which information may be obtained, the sum total of knowledge towards which the reader is guided must surely, for such a restricted subject, approach infinity.

Thus the select list of books which it contains includes only about five hundred titles (predominantly in English and post-1945), but these comprise nearly a quarter of a million pages of original text. Similarly, the 230 periodical titles listed (alphabetically, by subject and by country) and abstracting services named can lead to a wealth of articles on the industry. There is no indication of where specific publications may be consulted, but the lists of national and international textile organizations, which fill 44 pages, indicate those that offer library services.

Other chapters survey textile directories, detail statistical publications, list standardizing bodies and outline the use of patents as sources of textile information. In fact, the only significant omission is a 'Who's Who' in textiles.

MAUNDER, W. F. *ed.* Reviews of United Kingdom Statistical Sources. London, Heinemann—for the Royal Statistical Society and the Social Science Research Council, 1974.

Vol. 1: DAVIES, B. Personal Social Services *and* MURRAY, G. J. Voluntary organisations in the Personal Social Service Field. £3.25 (ISBN 0 435 82590 2).

Vol. 2: ALDERSON, M. Central Government Routine Health Statistics *and* WHITEHEAD, F. Social Security Statistics. £4.50 (ISBN 0 435 82592 5).

Vol. 3: FARTHING, S. M. Housing in Great Britain *and* FLEMING, M. C. Housing in Northern Ireland. £5.00 (ISBN 0 435 82594 1).

These volumes are the first in a new series which is intended as a successor to Kendall's *Sources and Nature of the Statistics of the United Kingdom* which, for many years, was the main source of articles on the derivation of social statistics.

This series goes into much greater detail than did its predecessor and includes a number of improvements. The most important is that each volume contains comments on the problems involved in interpreting the data and has fairly detailed definitions. There is still, unfortunately, little analysis of the meaning of the statistics to those who are being counted. Further innovations, however, are a quick-reference list of the statistical series referred to in each review and the detailed subject indexes. These make the text much more accessible. There are also fairly long bibliographies.

Despite the high price for the quantity of textual matter included in these reviews, they will soon become standard reference manuals for all who need to use social statistics and they will be essential items for any library covering this field.

AYRES, F. H. *and* HALL, J. *eds*. Information Services in University Libraries. Sconul. 1974. 214 pp. £2.25. [Available from: The Library, School of Oriental and African Studies, Malet Street, London, WC1 7HP]

These are the proceedings of the SCONUL Exchange of Experience Seminar on Information Services in University Libraries, which was held at the University of Bradford in December 1973. Although the title implies that the discussion at the meeting was restricted to developments in universities, this was not the case and there were a number of representatives from polytechnic libraries present. Several users of the services also participated, as did people concerned with commercial systems.

The papers in this volume cover all aspects of the operation of information services. There are several giving case studies of the services provided in universities, while another, by D. E. Bagley, outlines the functions of information services in polytechnics and John Martyn of *Aslib* gives an account of the OSTI University Information Officer Project. The views of users are represented by two academics (one a social scientist and the other a natural scientist). Also included are papers by Peter Leggate on the future of computer-based services and by Sue Evans on the problems faced by academic social scientists in finding information, as well as some general comments on the place of information services in universities by M. B. Line and F. N. Ayres.

The second part of this volume contains the replies given by university and polytechnic libraries in response to the questionnaires which were sent out prior to the seminar.

This publication gives a very useful picture of the current state of academic information services and some interesting pointers to the future.

DEPARTMENT OF EDUCATION AND SCIENCE. Public lending right: an account of an investigation of technical and cost aspects. London, HMSO, 1975. 53 pp. £1.50 (ISBN 0 11 270404 2).

A report of the findings to date of the Technical Investigation Group appointed by the Department of Education and Science in March 1974, to examine the technical and cost aspects of implementing a Public Lending Right. The original terms of reference of the group were to 'look into the statistical and automatic data processing aspects of setting up a PLR system based on counting loans from public libraries.' These terms were subsequently extended to include a technical examination of schemes based on the purchase of books by all public libraries, and of methods for taking books in reference libraries into account. The following comprise the main body of the Report: (1) summary of the schemes investigated; (2) machine readable codes, encoding and recording machines and their use: more detailed findings; (3) investigations into loan sampling and related aspects; (4) aspects of a purchase-based scheme; (5) registration and payment of beneficiaries and related aspects; (6) costs; (7) further research. Appendixes include a list of current members of the Technical Investigation Group and Steering Committee for Research; Libraries, authors and titles—detailed findings of Logica Limited; the International Standard Book Number (ISBN) and its incidence in library books; the pilot survey for the loan-based scheme; costs; basic statistics of libraries, authors and titles.

RICKING, M. *and* BOOTH, R. E. Personnel utilization in libraries: a systems approach. Chicago, ALA, 1974. 158 pp. $8.50 (ISBN 0 8389 3155 3)

This book is the third and summative phase of the study made by the Illinois Library Task Analysis Project (ILTAP) and offers a rationale and a framework for making jobs functional to library goals. The work is divided into the following chapters: (1) task identification and analysis; (2) assessing the objective of the libraries; (3) programs to meet the objectives; (4) human relations management; (5) the completed model; (6) a task list. The work is designed to help administrators in all kinds of libraries to define more effective ways to use professional/technical/ clerical staffs to identify the kinds of activities which are typical of their training backgrounds. Its greatest use will probably be in small to medium-sized public and college libraries and in school libraries. This is not merely because the research upon which it was based was carried out in small to medium-sized libraries, but perhaps because more libraries of this size often do not have the personnel resources to perform the type of analysis this study provides.

Choose your carpets with confidence

from DODSON BULL

UP TO 30% DISCOUNT

ALL LEADING BRANDS

Wilton ● Axminster ● Oriental ● Tufted

- All makes available with full Manufacturers Guarantees
- Free delivery in U K
- Expert fitting service available

£200,000 carpets on display

in our extensive London and provincial showrooms

Free brochure on request to Dept. ALB

DODSON-BULL CARPET CO. LTD.

LONDON: 5 & 6, Old Bailey, EC4M 7JD. Tel: 01-248 7971
BIRMINGHAM: 164, Edmund St., B3 2HB. Tel: (021) 236 5862
BOURNEMOUTH: 268, Old Christchurch Rd., BH1 1PH. Tel: 21248
BRIGHTON: 2-5, North Road, BN1 1YA. Tel: 66402
BRISTOL 2-3 Royal London Hse, Queen Charlotte St. BS1 4EX. Tel: 28857
EXETER: 157, Fore St., EX4 3AT. Tel: 32019
GLASGOW: 166, Howard St., G1 4HA. Tel: (041) 221 3278
LEEDS: 12, Great George St., LS1 3DW. Tel: 41451
MANCHESTER: 55-61, Lever St., M1 1DE. Tel: (061) 236 3687/8/9
NEWCASTLE-upon-TYNE: 90-92, Pilgrim St., NE1 6SG. Tel: 20321/21428
WESTCLIFF-on-SEA: 495, London Rd., SS0 9LG. Tel: Southend 46369
Open: 9.00-5.30 Mon.-Fri., Sat. 9.00-12.00 (Manchester 9.00-4.00)

British Technology Index

CURRENT SUBJECT GUIDE TO BRITISH TECHNICAL JOURNALS

FOR TRACING AND RECALL

of {specific / recent} information

in the Field of Applied Science, Engineering and Manufacturing Technology

Monthly Parts and Annual Volume

THE LIBRARY ASSOCIATION

7 Ridgmount St. Store St. London, WC1 7AE

(Phone: 01-636 7543)

The Missing Persons Bureau.

Is it McDonald or McDonnell who's the physicist at Oxford? Dr. Arnold is with the Wistar Institute, but where's that? Is there anyone working nearby who might want to participate in our next seminar? How can I get in touch with Prof. Mayhew?

The next time someone asks you to track down the correct name or whereabouts of a scientist or an academic, industrial, or government organization, you can find the information quickly and easily with whatever small clue you've got. *IF* you go to the missing persons bureau—*ISI's Who Is Publishing in Science®* (*WIPIS*), the international directory of publishing scientists.

WIPIS quickly gives you answers to your "who" and "where" questions because we've designed it specifically for that purpose.

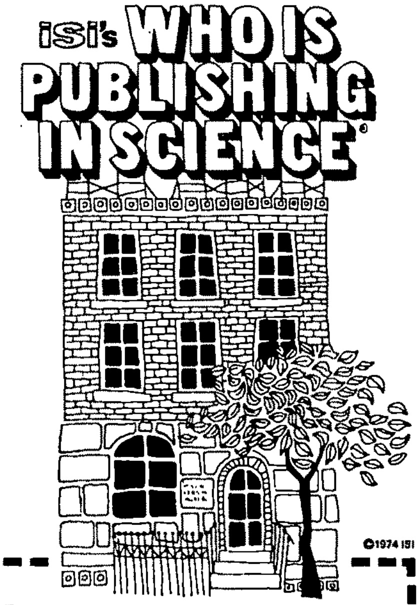
First, we made *Who Is Publishing in Science* comprehensive. Each *WIPIS* Annual includes the names and addresses of authors whose articles appeared in the world's most important scientific journals during a specified year (The 1974 *WIPIS* Annual, for instance, covers every issue of almost 4,500 journals published in 1973 to give you the addresses of 270,841 scientists and over 36,000 organizations in 159 countries.)

Then we made it easy for you to find precisely what you're looking for by indexing *WIPIS* 3 ways: by *author name*, by *organization name*, and by *geographic area*. That's why almost any clue will lead to the answer you're after

With *WIPIS* in your reference section, you'll find it extra easy to

- Get authors' addresses for reprint requests
- Determine what scientific and technical organizations are located in a specified area
- See whether an author published during a given year
- Verify the spelling of authors' names
- Determine what organization an author is associated with
- Help researchers locate colleagues
- Contact speakers and participants for seminars, symposia, etc.
- Differentiate between authors with similar names

***Who Is Publishing in Science* gets you the answers to some of the toughest day-to-day questions a librarian encounters. Quickly. Efficiently. Bring the missing persons bureau to your library. Just use the coupon below.**



ISI's WHO IS PUBLISHING IN SCIENCE®
©1974 ISI

ISI® Institute for Scientific Information
325 Chestnut St Phila Pa 19106, U.S.A., Tel (215) 923-3300, Cable· SCINFO, Telex: 84-5305

Please enter my order for the following Annual(s) of *ISI's Who Is Publishing in Science®* at $100.00:

☐ 1974 (covers authors who published in 1973) Available immediately.

☐ 1975 (covers authors who published in 1974) Available approximately June 1975.

Name ______________________ Title ____________

Organization ______________________

Address ______________________

City ____________ State ____________

Country ______________________ Zip ____________

☐ Payment Enclosed ☐ Payment in Process ☐ Please Invoice 13-411

Brand-new 1975 edition of "the only comprehensive guide to . . . active sources of advanced knowledge"—*Catholic Library World*

RESEARCH CENTERS DIRECTORY

FIFTH EDITION

A Guide to University-Related and Other Nonprofit Research Organizations Established on a Permanent Basis and Carrying on Continuing Research Programs. Edited by Archie M. Palmer. 1,056 pages. L.C. No. 74-11841. ISBN 0-8103-0453-8. $68.00.

With its usefulness proved by the four previous editions, *Research Centers Directory* now appears in a thoroughly updated fifth edition containing over 6,000 entries, of which 1,200 are new. The basic details furnished in *RCD* entries enable users to discover and contact specific sources of current information on virtually all aspects of man and his world.

A typical entry gives: 1) name of research unit, 2) address, 3) phone number, 4) director's name, 5) year founded, 6) status: affiliated, independent, etc., 7) sources of support, 8) size and type of staff, 9) annual budget, 10) principal fields of activity, 11) special research facilities and their availability for use by outsiders, 12) media in which results are published, 13) serial and periodic publications, 14) seminars, conferences, courses, etc., 15) library facilities.

EXTENSIVE NEW SUBJECT INDEX

19 CONVENIENT SECTIONS IN ALL

- Agriculture, Home Economics, and Nutrition
- Astronomy
- Business, Economics, and Transportation
- Conservation
- Education
- Engineering and Technology
- Government and Public Affairs
- Labor and Industrial Relations
- Law
- Life Sciences
- Mathematics
- Physical and Earth Sciences
- Regional and Area Studies
- Social Sciences, Humanities, and Religion
- Multidisciplinary Programs
- Research Coordinating Offices
- Subject Index
- Institutional Index
- Index of Research Centers

Periodical supplements to RCD

NEW RESEARCH CENTERS

Inter-edition supplement, with binder for new subscribers. ISBN 0-8103-0451-1. Subscription, $64.00.

Issues of *New Research Centers* provide descriptive information—in the same format as *RCD-5*—on newly formed and newly found research centers. In addition, significant changes in status or more details on the activities of centers listed in the *Directory* appear in *NRC*, with cross-referencing to the original entries.

Order the Fifth Edition of *Research Centers Directory* and *New Research Centers* on Gale's 30-day free-trial plan. Standing orders for future editions will insure automatic delivery.

GALE RESEARCH CO.

BOOK TOWER • DETROIT, MICH. 48226

REVIEWERS' COMMENTS ON PREVIOUS EDITIONS

"Recommended for all academic libraries and for large and medium-sized public libraries."—Bohdan S. Wynar, **American Reference Books Annual**

"Recommended for purchase."—**Choice**

"An invaluable reference work which should be available in all but the smallest libraries. . . . Important is the periodic supplement *New Research Centers.*"—Kenneth F. Kister, **Library Journal**

"This valuable directory is kept up to date by . . . *New Research Centers.*"—**Wilson Library Bulletin**

Published in England by Aslib, 3 Belgrave Square, London SW1X 8PL
Printed at the Alden Press, Oxford

14 NOV 1975

ISSN 0001 253

UNIVERS

Aslib Proceedings

A World Information System for the social sciences *Ralph Adam* 28

Who does the work? Observing library activities *Pauline A. Thomas* 29

Cases in financial management *Richard Dobbins* 301

Draft Definitions: information and library needs, demands and uses: a comment *Norman Roberts* 30

JULY 1975
VOL. 27, NO. 7

Buying full-text copies of journal articles as few as 5 at a time?

Then you'll probably find our *Original Article Tear Sheet (OATS®)* service is faster, better and less expensive than any other source of full-text copies.

Certainly you've at least heard about OATS. The service that usually provides actual tear sheets of articles, not just photocopies. The multidisciplinary service you can count on for all-but-instant response to just about any request.

Yet perhaps you still hesitate to use OATS because you feel any service that good must be expensive. If so, you've just caught up with another "must be" that isn't. Here's what OATS really costs any time you can order as few as 5 journal articles at once:

No. of Items Ordered at One Time	Cost per 10-Page Item
5-10	$3.40
11-20	3.35
21-30	3.30
31-50	3.25
51-100	3.20
Over 100	3.15

Compare our prices to those charged by other full-text sources. You'll find we're more than competitive. Place an order, and you'll find our service is, too. Or, for more information before you order, mail the coupon to OATS specialist Alan Clarke. You'll hear from him.

Yes, Alan Clarke, I like those OATS prices and the idea of one-stop shopping for journal items. So . . .

- ☐ Mail me more information.
- ☐ Phone me.
- ☐ Have an ISI field rep contact me.

Name ______________________ Phone No. ____________

Organization ______________________

Address ______________________

City ______________ State/Province ______________ Zip ________

13-426

®Institute for Scientific Information®
325 Chestnut St., Phila., Pa. 19106, U.S.A., Tel: (215) 923-3300, Cable: SCINFO, Telex: 84-5305

©1975 ISI

Aslib Proceedings

VOLUME 27 JULY 1975 NUMBER 7

© 1975 Aslib and contributors

Aslib Proceedings *is published monthly and supplied free to members of Aslib. Subscription rates are £18.00 annually to non-members, or £9.00 to Aslib members requiring additional copies. Single copies £1.70, or 85p to members.*

Further information about Aslib's services and membership rates will be supplied on application to the Director, Aslib, 3 Belgrave Square, London SW1X 8PL. Tel: 01-235 5050. Telex 23667; answer-back, Aslib London.

Notes for contributors

Aslib Proceedings now accepts contributed papers in addition to those presented at Aslib meetings and conferences. They should be of a practical nature and of some relevance to problems encountered in the everyday operation of library and information units, or services. Other kinds of contribution which will be considered for inclusion are short notes on new information units or special libraries; the introduction of new techniques or systems in existing libraries where these may be of general interest; equipment designed by members for special purposes and put into operation in their own organizations; and objective reports on experience with new 'packaged' commercially available information services.

Contributions, which should be typewritten, double spaced, single-sided on A4 paper, and not more than 3,000 words in length, should be addressed to the Editor, *Aslib Proceedings*, 3 Belgrave Square, London SW1X 8PL. If possible, authors should include a summary of up to 200 words with the typescript. Authors will receive twenty-five offprints of their article free of change.

A World Information System for the social sciences

Ralph Adam

The City University, London

Paper presented at a joint meeting of the Scottish Branches of Aslib and the Institute of Information Scientists, Edinburgh University, 6th February 1975

Abstract

A summary of the report of the Unesco meeting of experts on the problems and strategies of incorporating the social sciences into the world science information system (UNISIST) is given, followed by discussion of the implications for social scientists, as users of information services, of some of the proposals put forward at that meeting. In particular, the problems involved in standardizing terminology for thesauri and other bibliographical facilities, and the advantages which are likely to be derived from common standards of data collection are discussed.

Background

IN 1971 A REPORT was published on the feasibility of creating a world science information system[1] and UNISIST was launched. The object of the system was to rationalize scientific information facilities into an integrated, compatible network of co-operating services with recommended standards for linking and co-ordinating its elements. When the report was published, Brookes commented: 'Social scientists inspecting the UNISIST prototype model could reasonably ask what information scientists have been reading in the past twenty years.'[2] His criticism was aimed at the philosophy underlying the UNISIST proposals, but it could equally well have expressed concern at the lack of consideration given to the social sciences in the design of information systems in general.

The UNISIST proposals were aimed initially at the natural sciences and their associated technologies. The first major attempt to investigate the possibility of setting up a world information system for the social sciences took place in the summer of 1974 when a Unesco-sponsored meeting was held at Valescure in France. About twenty experts from all over the world, who were invited because of their specialized knowledge and experience, the diversity of their backgrounds and their institutional affiliations, took part. A wide range of topics concerned with the information needs of social scientists and the facilities which are, and should be, available for meeting these needs was discussed. However, the most valuable outcomes of these deliberations were, firstly, the discussion of the policy implications of a world-wide social science information system and, secondly, the identification of areas for further research. Because of

Aslib Proceedings 27 (7), July 1975, pp. 286–293. Printed in Great Britain

the importance for future developments of many of the topics which were discussed at this meeting, the object of this paper will be to outline briefly the main features of the report of the meeting and to discuss, with their implications, some of the points which it raises.

The Valescure Meeting

Many of the technical recommendations of the UNISIST programme were felt by the participants in the Valescure meeting to be acceptable for the social sciences. They felt that the development of information systems in the social sciences should be based on three main principles. These were: that such systems should be world-wide in extent and not just limited to input from particular areas; that the information contained in such systems should be available on a universal basis and without restriction on access; that systems should be set up on an institutional arrangement, in such a way that their continuity is assured.

In the report of the meeting[3] the basic elements necessary for the creation of a world social science information system are reduced to five main types of consideration: the major characteristics of social science information, the impact of these characteristics on information policy, the organization of data sources, the control of terminology and the relationship between the users and the suppliers of information services. Each of these topics suggested significant areas for future research.

The distinctive characteristics of social science information that are discussed in the report can be conveniently summarized as follows:

1 Materials in the social sciences are needed by a much wider range of users (both in type and level of sophistication) than are those in the natural sciences—where information services (other than at a very general level) are used primarily by scientists and other specialists. User groups include: administrators, policy makers, businessmen, social workers, lawyers, etc.

2 Conversely, in most of the social sciences, the range of potential subject-matter is extremely wide. It is also relatively more difficult to make relevance assessments—especially for someone else.

3 Certain types of information and data that are important in the social sciences are not found in other fields, or are of much less consequence there. The three main types are:
   - i conceptual information which is rarely suitable for condensation and is also subject to problems of definition
   - ii statistical and other numerical data which often need to be strictly up to date and in such a form as to be disaggregated and reconstructed in order to meet sudden shifts of interest or to allow for a change of emphasis in the requirements of analysis. Much statistical data is collected only to serve particular administrative or political ends.
   - iii data which are initiated in non-Roman characters may not be easily incorporated into systems based on Roman alphabets, where differing cognitive systems are involved.

4 Much information is of restricted value in terms of time and/or place. It may be of only ephemeral interest (*e.g.* because it is produced to meet a

specific need or because it will become out-dated soon) or it may have relevance only to a specific geographical or cultural unit.

5 Social science knowledge can be packaged in a wide variety of ways, *e.g.* by subject matter, problem, geographical area, professional need (lawyers, educationists, etc.), form of material.

6 Special forms of output are often necessary to satisfy these needs. They can range from complete technical documents and collections of raw data to highly condensed or popularized summaries.

7 Social science materials are recorded in a wide range of media and formats—the printed word, machine form, pictorial, cartographic and other visual forms, sound recordings, etc. The organization and description of such varied formats present problems when related to users' needs.

8 Social scientists place a heavy reliance on informal means of communication and are often reluctant to use formal channels. Thus, it is frequently very hard to find out what is currently going on in certain fields. This is made more difficult by virtue of the fact that many social scientists are convinced that they know of all that is being done in their own areas of research, thus providing little impetus to the improvement of such facilities as bibliographical tools and data archives.

9 There is a great deal of reluctance to use data at a secondary level or to replicate earlier research and this also results in relatively low reliance on the types of facility just mentioned.

10 The boundaries between disciplines are neither static nor clearly defined and the scope of the social sciences as a whole is subject to varying definitions. Furthermore, researchers are often more concerned with differences between theoretical perspectives than with formal disciplinary divisions.

11 Social scientists' work is more significantly affected by their own world views which are influenced by social, national, religious, linguistic, cultural and ethnic differences.

The problems involved in formulating national information policies for the social sciences led to considerable discussion at the meeting, of the ways in which countries in different geographical regions and at different stages of development organize the social sciences. Some information, in the form of case studies, has already been published as a Unesco survey.[4] This approach could be developed through further studies of individual countries so that initial data could be collected on the types of national facilities that are available in terms of the bibliographical control of the various forms of recorded knowledge, the availability of data archives, the character of inter-lending facilities, the degree to which records of research in progress are compiled, and so on. Case studies of particularly effective systems would also be valuable as these could provide guidelines for the development of new systems.

Detailed means for inter-connecting existing information services and for the standardization of data formats and bibliographical records in ways that are compatible with the UNISIST approach[5,6] were felt by those at the meeting to introduce a number of difficulties in implementation. The sorts of data that were considered under this heading included not only numerical material, but also such things as survey responses and ethnographic records. The types of work that could be carried out in this area would relate to the standardization of data files so that common units and definitions would allow for increased comparability, the central storage of certain types of data and the implementation of standard modes of bibliographical description.

The control of terminology in the social sciences is of great importance if usable thesauri are to be developed; much of the meeting was devoted to the problems associated with the relationship between verbal access to data and concepts and access to them through bibliographical classification systems. It was recognised that a great deal of work needs to be done on the ways in which social science concepts and terms can be analysed in such a way that they are amenable to use in automated retrieval systems, and that the necessary research on conceptual analysis and the development of indexing systems should involve social scientists and software experts as well as information specialists.

The participants at the meeting considered that the relationship between information services and the needs of their users could be strengthened in various ways. The wider use of information officers as intermediaries might, as Line has suggested,[7] allow for the setting up of systems at a relatively high level of sophistication. Education should also play an important role. There appears to be an obvious need for the users of information services to be trained in the techniques of information handling and communication, and also for those who supply the services to be made more aware of the information needs of the social scientists for whom the facilities are being provided. The creation of links between information specialists and practising social scientists, through the development of suitable national organizations would also be valuable in bringing the two groups closer together.

Towards a World System

The report of the Valescure meeting can, insofar as the social sciences are concerned, be seen as the most important step to date in the development of a 'world pool' of information.[8] Although it does not attempt to create what Wells foresaw as a 'world brain',[9] in which all the significant information on a given topic could be located through one central source, it does provide a framework for co-ordinating the means of organizing such a system and the facilities for arranging it in such a way that could eventually lead to the establishment of a unified information system for the social sciences.

In many ways the Valescure report both adds to, and reinforces, the views expressed by the OECD Information Policy Group in their 1971 statement on *Information for a changing society*,[10] and it is important that the two reports should be seen to be complementary. Although the OECD report is concerned with information policies for science and technology in general, one of its main themes is that science policy must be linked to social and economic affairs and that scientific and technical information is only part of 'an immense complex of information, including economic, social, legal and political aspects.' Another important feature of both reports is their concern that the needs of users should be the primary consideration in the design of information systems.

Social science information

Any discussion of the feasibility of a world information system for the social sciences must raise the question of whether it is more profitable to base such discussion on the materials and information that are used primarily by social scientists themselves, or whether it is more worthwhile to talk about something that can vaguely be referred to as 'social science information', irrespective of who the potential users are likely to be.

The former seems to be the more useful of the two approaches. Social science information and data are utilized by a wide range of (in this context) marginal categories of user, in addition to social scientists. The most important of these are the various groups of 'social technologists' (using 'technology' in its broad sense of the systematic application of arts and sciences to useful ends[11]), such as social workers, educationists and planners. In addition, many other groups, particularly historians, use such material. It would, however, be very complicated to try, at this stage, to incorporate the needs of such disparate user groups in a system which requires determinate boundaries of one form or another. It was partly because of an awareness of the varying approaches towards information of the different categories of user, that the Valescure report recommended that all areas of knowledge, including the humanities, should be brought into the UNISIST programme at an early stage. Each type of user has its own information needs and patterns of use and, especially in the case of technologists, does not necessarily require large quantities of conceptual information or of primary data. The distinction made here between social scientists and technologists is very similar in many ways to that between physical scientists and engineers or to that between biological scientists and physicians.

The wide range of subject matter which is studied by social scientists should not, in itself, be seen as an objection to the setting up of a world information system. Once an effective system has been established it should be necessary only to switch from one sub-system to another for a user to interrogate any particular data source—including those in the natural sciences. This is particularly so as social scientists with interests in other fields are not usually in need of information at a deep level. For instance, someone studying the economics of the machine-tool industry would not be concerned with the more technical aspects of manufacturing and operation of the tools and, similarly, if the same person were to investigate the cognitive factors underlying the decision to purchase a particular brand of machine tool he would not want to get deeply involved in the psychological theory, but would merely want to know of the choice of possible methods of analysis and the problems involved in using each of them.

Information scientists see three major problems which currently face social scientists when they try to locate and use the results of other people's research. These are the differences in terminology used, the non-comparability of statistical data and survey findings and the lack of efficient and effective tools for locating and retrieving data. Problems lie in the minds of their perceivers, and social scientists, themselves, often do not define terminological differences and the lack of bibliographical facilities as problematic. In the main, it is information specialists who perceive the existence of such problems. Sometimes this is because they do not understand the ways in which social scientists see the world and construct reality.[12] Partly because of the subject-matter with which they are dealing, social scientists often use information in different ways from natural scientists and have a different form of relationship with it.

Standardizing terminology

According to the conventional wisdom of information science, terminological differences in the social sciences are due to the 'loose' or 'soft' use of language and to 'woolly' thinking. Many information specialists are convinced that the main way to make communication amongst social scientists easier is to standardize vocabularies. There may, of course, be some justification in the accusations that are made but such thinking does, nevertheless, fail to take into account the way in which theory in the social sciences develops and how words come to be used in the way that they are. It is not always carelessness that leads to one word having several meanings or to a situation in which a number of words appear to describe the same concept. The causes of such states-of-affairs have been discussed in detail elsewhere.[13] However, the former situation often arises when writers using different theoretical perspectives develop their ideas from the same starting point (and it is essential that information system designers are aware that social scientists are divided by perspective, or tradition, as well as by discipline), while the latter can arise when two or more researchers independently describe the same concept. It is important to remember that terms are the names given to concepts and that it is possible for a concept to be discussed in the literature without ever being referred to by name—or for it even to not have a name at all.

These points have a great deal of relevance to the design of information systems and they do raise questions about the likely value of attempts to standardize terminology at a *conceptual* level. Unless such matters are handled with great care, they could create more difficulties than they solve by divorcing knowledge from the social context in which it is generated and used—as has been the case with traditional library classification schemes in the social sciences. Theoretical perspectives are shared understandings of which much is implied and is often not accessible to outsiders.[12] This makes for great difficulties in the development of restricted vocabularies which are able to take into account sufficient of the relevant factors for them to be of use to social scientists. They would need to allow for varying perspectives and to try and translate these into a common language when the constituent elements operate at different levels. These problems also extend to the creation of multi-lingual dictionaries and automated information retrieval systems, but there is more than just a ray of hope from an international group which is working on this.[14]

Use of bibliographical tools

The relatively little interest taken in bibliographical tools by social scientists is closely related to the above points. This lack of use is not necessarily due to laziness but, rather, to the irrelevant way in which most such tools, with the possible exception of citation indexes, are organized. In general it is a traditional subject approach which predominates, which, when linked with inconvenient arrangement, is hardly an encouragement to use. As Campbell has pointed out in another context,[15] Freud's 'pleasure principle' says that people will do something more often and better if they get pleasure out of it, while the law of least effort says that they will put as little effort into it as they have to—and this may mean not using the facility at all.

Another problem relating to the use of bibliographical tools is due to the fact that much of the material which is published in the social sciences is of relatively little value to others, and it is often not possible to determine this from an index entry or from a non-evaluative abstract. If it became practical, the UNISIST proposal of quality filters might help to remedy this.

Organizing data

The situation regarding statistical and other numerical data is rather different. There are a number of areas in which it seems that a coherent set of recommendations could, if they were adhered to, make a vast improvement to the facilities available. Many series of official statistics, for instance, are not consistent or are not comparable with similar series because different bases have been used in their construction (with no allowance being made for translation from one series to another), because varying time periods have been used or because definitions of what is being counted have changed over time. Such inconsistencies apply not only on an international level, but are also common within individual countries. The creation of an international body which was in a position to make recommendations on such matters would be a valuable development. Similar arguments apply to the collection of survey data. It is not hard to appreciate the advantages that could be derived from the coordination of data collection (through standard definitions, standardized time periods, etc.) so that the findings from different surveys would be compatible. Such a development might also help to reduce the amount of indiscriminate data collection that goes on—especially if more comprehensive survey archives or, at least, unified listings of material could be established. Because social science researchers are often very wary about publicizing their data and making it available to others, it might be feasible to set up an international body to devise a code of ethics for data dissemination and to draw up recommendations as to periods of restricted access. It might also be possible for such a body to make recommendations as to which items of information ought to be collected as a matter of course in particular types of survey, in order to allow unrelated findings to be made more compatible with one another.

Bibliographical standards

It was suggested earlier that many of the technical recommendations for bibliographical standardization made in the UNISIST study could be applied directly to the social sciences. Even here, however, special considerations should be taken into account. For instance, the idea of an International Serials Data System has various problems associated with it because of the difficulties involved in locating and recording the more diverse and short-lived serials. These are often produced by small groups (such as academic departments or people with common ideological positions) on very small budgets and can be hard to trace. They may also appear only sporadically. Other decisions would have to be made regarding series produced by pressure groups and in the case of such things as working papers, which are now becoming common in some fields. These are, however, points of detail and not criticisms of the principle.

The overall co-ordination of recommendations and policy are, of course, necessary and it seems reasonable to make use of such mechanisms as are already available. However, although it may be useful to take advantage of the UNISIST focal points and other structures, facilities which are already being developed or which are already in existence could well be incorporated into a world system. Work which has been done independently, but for similar purposes to those put forward in the UNISIST programme (such as CLOSSS[16]) ought to be given particular consideration for inclusion in a world-wide social science information system.

The Valescure meeting provided a means whereby a variety of people with a common concern about the current state of social science information services were able to get together and concentrate their energies on formulating ways in which an international system might be developed.

This has provided an excellent starting point from which a co-ordinated programme of innovations designed to test the feasibility of some of the many ideas that were propounded at that meeting can be tried out, and it would be very unfortunate if this opportunity were to be missed.

REFERENCES

1 UNESCO/ICSU, UNISIST: Study report on the feasibility of a world science information system. Paris, Unesco, 1971. The implementation of the programme is reported in *UNISIST Newsletter* No. 1, 1973—.
2 BROOKES, B. C. Review of—UNISIST: Study report.... *in J. Docum.* 27 (3), 1971, p. 216–20.
3 UNESCO, Meeting of experts on the problems and strategies of incorporating the social sciences into the World Science Information System (UNISIST). Final report. Paris, Unesco, 1974.
4 UNESCO, Social science organization and policy. First series. Paris, Unesco/Mouton, 1974.
5 CHAPLIN, A. H. Basic bibliographical control: plans for a world system. *Aslib Proc.* 27 (2) 1975, p. 48–56.
6 HORSNELL, V. The intermediate lexicon: an aid to international co-operation. *Aslib Proc.* 27 (2), 1975, p. 57–66.
7 LINE, M. On the design of information systems for human beings. *Aslib Proc.* 22 (7) 1970, p. 320–33.
8 ADAM, R. Pulling the minds of social scientists together. *Int. Soc. Science J.* 27 (3). In press.
9 WELLS, H. G. *World Brain.* Methuen, 1938.
10 OECD, *Information for a changing society.* Paris, OECD, 1971.
11 FORES, M. Snow, universities and the generalist. *Higher Educ. Rev.* 3 (2), 1971 p. 53–66.
12 SWIFT, D., WINN, V. A. *and* BRAMER, D. A. A case study in indexing and classification in the sociology of education. 2 vols. Milton Keynes, Open University, 1973. *OSTI Report* 5171.
13 ADAM, R. Terminology and the Social Sciences: a case study. *Communication and Cognition,* 8 (1), 1975.
14 SARTORI, G. The tower of Babel. COCTA Working Paper No. 5. Honolulu, University of Hawaii Social Science Research Center, 1972.
15 CAMPBELL, D. J. Unco-operation by (and between) librarians and information workers. *Aslib Proc.* 22 (10), 1970, p. 497–506.
16 BRADSHAW, R. G. *and others,* CLOSSS (Check List of Social Science Serials): a machine-readable data base of social science serials. *Program,* 8 (1), 1974, p. 29–39.

Who does the work? Observing library activities

Pauline A. Thomas

Aslib Research and Development Department

WHO DOES WHAT is a deceptively simple question with which to begin an analysis of library operations. An answering comment on a questionnaire I used recently was that 'some people seem to do just as they like, and for all an analyst's delight in identifying and labelling systems, sub-systems, procedures, activities, tasks etcetera and so forth, I suspect basically, in the library context, as in other organizations, many people do more or less just as they like.' In spite of systems studies, O & M, MbO, PPBS, OD and other snappy or not so snappy acronyms for management anxiety about organizational effectiveness, each newly labelled technique includes hints about the difficulty of actually implementing the recommendations made. There is always the 'human factor' that can make or mar the most elegantly designed system.

An American study states that 'a library is what its members do'.[1] For some years now my own work has consisted of finding out what other people do, by talking to them about their jobs, listening to some of their problems, and some of their enthusiasms too, and asking questions.

My starting point was a task analysis of library operations, but in the last few years my attention has shifted from the work that is done in libraries to the people that do it, and the ways in which they approach their jobs. A task analysis is time-consuming, but reasonably straight-forward to do. It is, however necessary, only a beginning. More study is needed to explore not only the traditional standard approaches to work rationalization—the who, where, when, why and how often questions—but also the way in which tasks are grouped together to form one person's job, the job's relationship to other jobs within the system, the key tasks and priorities that lead to effective performance, and the factors that contribute towards job satisfaction.

One of the ways in which we have used the task analysis is in developing a computer-based simulation of library operations. We simulate systems for the same reason that we analyse them, because we want to understand how they work, and to predict how they might react to change, and to try to improve them. We wanted a number of things from our own simulation. We wanted to be able to use the model as a testing device: to try out changes in the system to see if it looked as if they would improve matters. We wanted to provide useful information for managers. The model we developed supplies us as our own system managers with useful information. If we can make it sufficiently flexible to simulate a range of actual systems, we should therefore be able to supply librarians with similarly useful information.

In fact, we are in the process of testing the model by simulating an actual

Aslib Proceedings 27 (7), July 1975, pp. 294–300. Printed in Great Britain

system, and some of the information already produced has been used by a librarian in making decisions about re-allocating tasks. We hope also to use parts of the model to develop simulation games for educational purposes.

Starting with a detailed description of procedures, activities and tasks gathered during the study of the use of bibliographic records in libraries, we devised a set of programs to simulate the workings of an imaginary library system. Having descriptions of the work to be done, we then had to divide it between our imaginary library staff—and proceeded to make our own managerial decisions on how many staff we needed to cope with the volume of work, which of our LASSES (short for Library Assistants) was to do which collection of tasks, and how long each should take. Our decisions were based, as are other managers' decisions, on our experience... on information gathered from previous work, on published information, and finally on our subjective judgement on likeliness of fit. We ended up with eight library assistants, we split the cataloguing and classification tasks into two jobs for two different assistants and separated the reproduction of the catalogue entries (the sort of specialization that has often been the first to be differentiated as a library grows). The volume of work was based on around 380 book selections from library staff plus around 80 users' requests a month (some of which of course turned out to be already in stock or on order when our LASSES checked on them). We allowed 720 loans transactions, some of which were returned within the two weeks' loan period, some of which were overdue and had to be recalled, and some eventually rebound, replaced and withdrawn.

We simulated a period of 20 working days of 8 hours a day repeated three times to give a total of 3 months' operation. Already it is possible to see how the work builds up, and where delays in the processing are likely to occur. It is also possible to isolate items where the processing time appears so excessive that an attempt to improve things should be made. The information printed out at the end of a simulation run includes: the average utilization of each member of staff, in figures and in a histogram form which makes rather more impact; the average number of items in storage, which are files and temporary storage places like shelves in the catalogue department and book trolleys. Information on the contents of each of the queues and delay times are given, and tables showing the time an item takes passing through various sequences of activities.

A simulation model must be similar enough to the real situation for people to have confidence in its predictions. Our model is in a form that relates very closely to the real world, being based directly on detailed descriptions of library procedures. We have tested it for internal consistency: the numbers and proportions of items in the system are appropriate to the functional rules and relationships that we set up. The language and form of the model are recognizable descriptions of library routines, and the times are based on observations and experience. In fact, the model paralleled reality so closely that we suffered management problems as well as the more expected computer and programming language difficulties. We had to determine loan periods and recall policies, ensure that users' requests received priority treatment, and that the issue desk was manned in the lunch period. The books and forms could wait for attention, but we could hardly expect our users to stand around waiting for a library assistant to come back from lunch!

We also found that we needed more assistants to cope with the workloads than we had originally intended to use, and had to re-allocate jobs as we found some of them were overworked and others had an easy time of it. We even had to write one assistant out of the system altogether, as the program gave us an extra one we had not asked for, who appeared only to go to lunch each day!

Our primary concern with this initial project was to translate a basic library system description into a form that could be simulated on a computer to produce operational statistics for a stated period of simulated time. The pilot model achieved this aim, and has now been tested in an actual system—but its usefulness depends on developing the necessary flexibility for us to investigate other aspects of systems design and to simulate a range of library systems. Given the credibility of the model, decisions for action in the real world can be taken using the information it provides.

Simulation gives us a chance to experiment, to vary inputs, processing times and methods, and the allocation of work, and to see the likely effects of these changes on the whole system in terms of the utilization of each member of staff, the possible trouble spots, where queues may form, and where action should be taken to improve matters.

I say 'likely effects,' because no social or personal things are included in this model, although we do insist our imaginary LASSES or LADS go to lunch every day at a reasonable time, and that users' requests are dealt with urgently. We will spend much of this year making the model more flexible and experimenting with such factors as staff absences, recruitment and training variations, and shift duties, to bring it that much closer to reality.

Another project that was also concerned with librarians' activities, and that emphasized the importance of the human aspects of organizational life, was the exploratory study of librarians as managers.[3] We wanted to know what management activities Chief Librarians and their senior staff were engaged in. We wanted to develop a categorization based on actual happenings in the working day of practising librarian–managers rather than imposing a theoretical classification derived from more general management literature. We hoped also to identify recurring problem areas common to the management of different types of library so that we could work on more specific projects helpful to Aslib members.

A number of senior librarians very helpfully agreed to participate in the projects, and talked to us in some detail about their work, specifically about the non-operational aspects. We were not concerned with cataloguing or information work, nor with any of the procedures that we had studied before, but we were interested in everything else. We read any documents available, detailing the background of the library, policy and committee matters, minutes of meetings, staff instructions, library guides. The librarian then filled in diary cards for us, one card for each action over a period of two non-consecutive weeks. We kept closely in touch with them during this period, collecting the cards daily where possible, and sorting out any queries on the spot or by telephoning.

In addition to the information on the subject matter of each action, we learnt a great deal about the media of action: the letters, reports, telephone calls and meetings that occupied the time of these librarian-managers. Our first report details this sort of information.[4] The largest proportion of time was taken up by meetings, and many of these were unplanned meetings. The most time-consuming were with people from outside the organization, but the numbers of meetings with staff are proportionally much larger.

Reasons for studying any job include the possibility of organizing the work more effectively. It is of course for the librarian himself to define his own priorities, but unless the pattern of work is known, it is easy to become immersed in day-to-day activities, and to lose sight of overall objectives. Useful/alternative courses of action may be missed. More meetings or less may be the better strategy in an individual situation, and things can be arranged accordingly. More use of the telephone or internal memos may be useful, and the location of parts of the job may be varied. We suggested that if a librarian estimates the proportions of time involved in using the various media of action and then keeps a diary he may wish to change his method of work to bring it more in line again with his priorities.

In analysing the subject matter of the activities, we found three main areas: the immediate environment, composed of contacts with and about the parent organization and the library's users; the core executive functions of planning, organizing and controlling the system as a whole; and eight more specific areas of activity, accommodation, finance, equipment, materials, staffing services, P.R., and professional activities. There were less activities related to planning, organizing and controlling the whole system than there were involved in coping with individual activity areas, and there was little contact with users. A great many activities were concerned with library staffing, and there was a very definite involvement in professional activities (taking part in and attending conferences, reading and writing articles for the professional literature and contact with other librarians).

The larger number of meetings with members of staff reflects one problem area spontaneously lamented by each librarian we interviewed, that of communication within his own organization. Many of them were trying to improve things, by newsletters, staff meetings, working parties, 'leaving' and Christmas parties, weekend courses, intentional use of the grapevine. . . . but were uncertain of the effect of their efforts.

The problem was made worse by that other 20th-century cry, the rapid rate of change. Change, if not planned for, is certainly thrust upon most managers, librarians included: local authority reorganization, industrial mergers, take-overs, redundancies, economy drives, the growth of the polytechnics and of interdisciplinary courses of study, cutbacks in University budgets, a.d.p., and social change. Peoples' expectations are changing, user-people and staff-people. Different needs for different services are being recognized, and the movement for more staff participation in organization matters is flourishing.

In circumstances like these, there is an even more vital need for people to know what the organization is doing, and where they fit into the overall plan.

Every job is made up of a unique combination of content and context elements, and most important of all, individuals vary. People put their own personalities into the work that they do. Everyone has his own style, his own needs and his own methods of setting priorities, and his own pattern of relating to other people in the organization. There are, however, certain limits of variation. The roles which people occupy partly determine how they will behave, so it is important to have the right structure of roles for effective performance. At the same time, people's personalities, perceptions and experiences also determine how they will behave in their roles and how they will relate to and communicate with others and both these factors must be considered in working towards organizational effectiveness.

I found a definition of management that I like in a BIM booklet about Organization Development by Charles Margerison[5]: 'Managing is substantially a matter of talking and listening in order to solve problems.' We found librarians just as occupied in this activity. Some of them were finding helpful ideas in current approaches to organization design and operation, such as MbO, PPBS, O.D., and corporate management. Management by Objectives emphasizes staff participation and the joint determining of objectives. It attempts to stimulate more effective task-directed communication and to clarify individual roles and expectations of performance: to make these explicit so that a member of staff is involved in deciding what he thinks he might reasonably achieve and knows what his manager expects of him. PPBS (planned programme budgeting systems) is aimed at senior management levels and is a system designed to assist decision making by monitoring results and the feedback of information to update and revise original objectives. Apart from making explicit the cost implications of policy decisions, the expected benefits of using this approach are similar to those of MbO, targets are set against which performance can be checked, objectives are clarified, outputs rather than imputs are emphasized, and relationships between the objectives of various roles are highlighted. A LAMSAC report on the subject suggests that these major objectives may well be complemented by the use of MbO at other levels in the organization.

O.D. or organizational development programmes are similarly concerned with improving effectiveness, and emphasize planned change, and individual involvement. Organizations are social systems of people as well as technical systems of materials and equipment. Typically an O.D. programme is an effort to improve organizational effectiveness using methodologies and interventions based on the behavioural sciences. The list of possible benefits sounds familiar:

clearer organizational goals
more reliable communication
increased teamwork
more effective problem solving
greater responsiveness to changes in the environment.

Two research projects which developed partly against this general background and partly from the librarians as managers study, are concerned with the problem of managing change, and both are dependent on effective communication within the organization. The first is an attempt to trace and to document the changing managerial structure in an educational library. The second will study the adoption of an MbO programme in a library system.

Communication is not a simple process. Even at the level of the use of bibliographic records in libraries it was obvious that there was very much more involved than the forms and the explicit information they carried. So much of the information necessary for the work to be done was supplied by the individual's knowledge of his role in the system, by his past experiences in his work, by the position of the form in a pile on his desk or in a drawer of a filing cabinet. Individuals derived different information from the same form according to the stage in the sequence of processing procedures that had been reached. And, of course, the absence of certain expected elements was sometimes more informative than their presence.

These elements of implicit rather than explicit information made it difficult to describe certain aspects of operational jobs. It was not possible to say just what information a person was actually working on, only to identify a basic minimum of information elements and forms that appeared absolutely necessary to the work. I could not say what improvements could be gained by additional information, nor could the librarians I spoke to identify which elements they used. The 'message' was a complex of explicit and implicit elements of information derived from the context of form and individual brought together at a certain time and place.

It is therefore not surprising that it is even more difficult and important to study communication in less structured roles. Especially as our reports on librarians as managers indicate the amount of time spent and the variety of activities that involved senior library staff in direct communication with other people. If we can contribute some knowledge of the value of effective communication, and some aids towards improving communication, we would be directly affecting a large area of activity and hopefully contributing to more effective and more satisfying organizational life.

Both of the organizational studies mentioned deal with planned change, the programmes emphasize the involvement of groups or teams of staff in planning and implementing changes and both rely heavily on effective communication. They are concerned with areas of activity and perception that are notoriously difficult to document, the human approach or man-management problems. Research methods include interviews, questionnaires, observation and group discussions, with the research worker getting much more closely involved in the system being studied than in some forms of analysis. Investigation of systems problems has always affected the subject studied to some degree, organization development programmes positively encourage this. In talking about change to the individuals involved, one necessarily contributes to the overall effects, clarifying, confirming, altering perceptions about them.

These are not new ideas, the problems have been with us a long time; O & M practitioners, work study experts and organizational consultants generally have worked along these lines. Whatever preferred terms are used for these approaches to improving organizational effectiveness, planned change, staff participation, shared diagnosis and 'owned' solutions are useful concepts and antidotes to analytic abstractions.

Task descriptions do have a certain dryness. As one respondent said to me 'you've left out the exciting bits', but we do need to know these basic essentials before we can add the interesting parts to the whole picture. I am now in the pleasant position of trying to find ways of including some of this excitement. Librarianship is, after all, a highly motivated profession, although the protestant/puritan ethic of the seriousness of work may have made us hesitant to admit how much we enjoy it, except to each other. This aspect too is changing, and with job satisfaction, motivation hierarchies, participation and consultation rife in the literature—to the accompaniment of varying degrees of managerial resignation and encouragement—we may yet all end up by doing more of 'just what we like'.

REFERENCES

1 WAYNE STATE UNIVERSITY. University Libraries, Working Paper no. 4, Towards an assessment of academic library organization effectiveness. ED 055626.

2 THOMAS, P. A. *and* ROBERTSON, S. E. A computer simulation model of library operations. *J. Docum.* 31 (1), March 1975, p. 1–18.

3 THOMAS, P. A. *and* WARD, VALERIE A. An analysis of managerial activities in libraries. Aslib, 1974. *Occasional Publication no.* 14.

4 THOMAS, P. A. *and* WARD, VALERIE A. Librarians as managers: an exploratory survey—where the time goes. Aslib, 1973. *Occasional Publication no.* 12.

5 MARGERISON, CHARLES J. Organisation development—a managerial problem solving approach. *Management Decision Monograph,* Vol. 11, no. 4, summer 1973.

Cases in financial management

Richard Dobbins

Management Centre, University of Bradford

Abstract

Readers are invited to study three cases in finance and accounting and compare their own proposals with solutions suggested by the writer. Case 1 is a capital budgeting problem, Case 2 an exercise in the application of marginal costing, and Case 3 an exercise in the presentation of a cash budget.

THE CRANFIELD SCHOOL OF MANAGEMENT and British Library have recently completed a joint programme in generating a series of cases in management studies for librarians. Subject areas covered by the Cranfield Library Management Programme include information planning and user orientation, finance and accounting, library operations, and management of human resources. The considerable interest in this work has stimulated the production of this paper which presents three of the thirty cases developed for the finance and accounting module. Those concerned with the management of libraries are invited to consider the cases and compare their recommended solutions with those suggested towards the end of the paper.

Case 1: the New Turnstile

On your recommendation the library purchased an electronic turnstile to cut down the loss on theft of books. The cost was £17,000 and the equipment was purchased exactly 1 year ago. Its expected life was 4 years and its expected scrap value at the end of its life £1,000. Accounting policy stipulated that the asset should be written off over its useful life on a straight-line basis, i.e. at £4,000 per annum, its present book value therefore being £13,000.

You have investigated the potential of new equipment currently being marketed at £20,000 which you feel will reduce the cost of replacing stolen books by a further £5,000 per annum. The expected life of the machine is 3 years with a residual value of £2,000. Your informal approach to the vendors has revealed that a trade-in allowance of £7,000 will be offered for the old equipment. You have recommended the installation of the new device to the finance committee and now receive the following memo:

'Sir,

On your recommendation we recently spent £17,000 on some equipment. You apparently now require us to spend a further £20,000. Please note the following very carefully:

1. The cost of the machine (£20,000) is more than the savings it will generate (3 multiplied by 5 equals 15).
2. Purchase of the new item will increase the annual depreciation charge from

Aslib Proceedings 27 (7), July 1975, pp. 301–307. Printed in Great Britain

£4,000 to £6,000 per annum, a fact which is ignored in your £5,000 per annum savings figure.

3. There will be a considerable loss on disposal (£13,000 book value less £7,000 cash equals a loss of £6,000). This year's accounts will simply not stand it.

We regret that we must reject your proposal, there obviously being no chance of the investment yielding the 10 per cent return we must earn on investment.'

Present a statement to the finance committee showing that the investment is worthwhile.

Case 2: the Journal of Library Finance

A group of librarians is considering the launch of the *Journal of Library Finance.* The group is concerned that the venture should not run at a loss, and requires you to calculate the required break-even subscription level. The following information is available:

Issues
The journal would appear three times each calendar year.

Editor
A member of the group would manage and edit the publication for a fixed annual salary of £1,200 plus commission of £1 for every subscription serviced during the calendar year.

Accounts
The year-end would be 31st December.

Promotional Cost
It is estimated that £2,000 would cover promotion in a normal year.

Contributors' Fees
Each issue would contain ten articles, each article costing £15 in contributors' fees.

Printing
A provisional agreement has been made whereby the printer is paid £700 setting-up cost for each issue plus 30p for each copy sold.

Employees
One capable female subscriptions controller/secretary can manage day-to-day operations. The suggested remuneration is £1,700 per annum plus a year-end bonus of 40p per subscription serviced.

Accommodation
A provisional agreement has been made for sharing an office. The journal company would pay £1,500 rent plus a contribution towards telephone, cleaning, rates, staff refreshments. This contribution has been provisionally agreed at 50p for each subscription serviced.

Postage
The average cost of mailing a journal is 4p.

Size of market
The venturers agree that market saturation is probably reached at 1,500 subscriptions.

Pricing strategy
It is felt that two alternatives are equally attractive. At £15 it is anticipated that subscriptions would level out at 900. If the price is restricted to £10, the venturers feel that £1,400 subscriptions would need servicing in a normal year.

Present 'normal year' profit and loss accounts as they would appear if all the venturers' estimates were correct assuming that the subscriptions are offered (a) at £15, and,
(b) at £10.

Which pricing policy yields the greater profit in a normal year?

Calculate the break-even level of subscriptions for each pricing policy.

Case 3: the Branch Library Cash Budget

Your branch library has been allocated £60,000 from the central library fund for the 6 months to 31st March 1975. Together with the chief librarian you have estimated the cash income and expenditure for each of the 6 months. After the meeting you are asked to present a statement showing the monthly cash requirement and the cumulative cash requirement from the central library fund. The following information is available.

Monthly cash requirement
On approximately the 10th day of each month an amount is credited to the branch bank account sufficient to cover all expenditures and, after taking into account any estimated revenues, leave a balance of £1,000 at the end of the month. On 1st day of October 1974 the cash balance is £1,000.

Book orders

		£	
1974	July	6,000	
	August	8,640	
	Sept	6,210	
	Oct	5,560	(estimated)
	Nov	9,600	,,
	Dec	4,500	,,
1975	Jan	4,500	,,
	Feb	5,800	,,
	March	7,000	,,

On average books are delivered with invoices one month after ordering. Invoices are paid the month following receipt.

Periodicals and journals
Invoices, paid the month following receipt, are receivable August £570, September £620, October £810, November £730, December £670, January £760, February £840, March, £1,000.

Salaries
Present staff salaries amount to £8,400 pa. No staff changes are expected in the budget period. Additional help early in December will cost £150.

N.H.I.
£10 per month.

Repairs and renewals

The annual cash outlay is estimated at £2,250. In previous years this outlay has been 100 per cent greater in December, January and February than in other months.

Printing and stationery

Invoices paid the month after receipt, are receivable August £230, September £140, October £210, November £330, December £180, January £190, February £200, March £200.

Information retrieval services

Annual cash outlay cost £3,600, 75 per cent of which accrues evenly during the period November–April.

Motor Expenses

£140 per month

Heat and Light

	Gas	*Electricity*
	£	£
Invoice: 3 months to 30.9.74 received 14.10.74	24	170
3 months to 31.12.74 received 11.1.74	28	330
3 months to 31.3.75 received 16.3.75	36	360

Invoices are paid the month following receipt.

Rates

£760 per annum payable 1st March and 1st October, cheques actually being despatched in April and October

Incidentals

Other cash outflows amount on average to £250 per month.

Capital expenditure	*Cash outlay*
	£
December	270
January	840
March	280

Standing orders

The library rents equipment at £540 per month.

Incidental receipts

Fines are estimated at £1,200 per annum, 70 per cent being received in the three months June–August. Charges for the use of equipment are estimated at £420 for the 6-month period. Rent of rooms is estimated at £400 per month for July–September, and £150 per month for the period October–June.

SUGGESTED SOLUTIONS

Case 1: the New Turnstile

(Suggested) Statement Recommending Purchase

		£
Initial cash outlay (20,000–7,000)		13,000
Cash flows Year 1	£5000 (0.909)	4,545

			£
Cash flows	Year 2	£5000 (0.826)	4,130
	3 (£5000+£2000−£1000)	£6000 (0.751)	4,506
Present value of future cash flows			13,181
Net present value of project (£13,181—£13,000)			181

The incremental cash flows are discounted at 10 per cent giving a present value of £13,181. This present value is greater than the initial cash outlay. The investment is therefore expected to yield a return greater than the required 10 per cent and its acceptance is recommended. In discounted cash flow procedures only cash flows are relevant. Non-cash expenditures such as depreciation do not appear in the calculations. The objective of the exercise is to compare the present value of expected future cash flows with the immediate cash outlay. If the present value of the anticipated cash flows is greater than the initial cost of the investment, the project is acceptable. Compound interest tables are used to determine the present value of future cash flows.

Case 2: the Journal of Library Finance

'Normal' year profit and loss account for the year ended 31st December

Pricing Policy		£15 £		£10 £
Subscriptions revenue		13,500		14,000
Expenditure:				
Editor's stipend	1,200		1,200	
Editor's commission	900		1,400	
Promotion	2,000		2,000	
Contributors' fees	450		450	
Printing—setting up	2,100		2,100	
Printing—running off	810		1,260	
Salary	1,700		1,700	
Employee's commission	360		560	
Rent	1,500		1,500	
Office expenses	450		700	
Postages	108		168	
		11,578		13,038
		1,922		962

Pricing the journal at £15 yields the greater profit.

Fixed costs

Editor's stipend	1,200	1,200
Promotion	2,000	2,000

Contributors' fees		450		450
Printing—setting up		2,100		2,100
Salary		1,700		1,700
Rent		1,500		1,500
		8,950		8,950
Variable costs				
Editor's commission		900		1,400
Printing—running off		810		1,260
Employees' commission		360		560
Office expenses		450		700
Postages		108		168
		2,628		4,088
Variable cost per subscription		2.92		2.92
Contribution per subscription		12.08		7.08
Price of subscription		15.00		10.00
Break-even subscription level	$\frac{8950}{12.08}$	741	$\frac{8950}{7.08}$	1,264
Break-even subscriptions revenue		£11,115		£12,640

If the venturers launch their journal, variances from budgeted income and expenditures will arise for many reasons. The above exercise in marginal costing distinguishes between costs which vary with the level of sales and costs which are fixed. It gives some guidance as to the level of sales required for the venture to trade at neither profit nor loss. There is a high probability that neither of the two pricing policies considered yields the greatest net income possible. More profitable pricing policies may appear if the venturers can define the relationship between price and sales.

Case 3: the Branch Library Cash Budget

Branch Library: (Suggested) Cash Budget for the six months to 31st March 1975

	October	November	December	January	February	March	Total
CASH INFLOW:							
OPENING CASH BALANCE £	1,000	1,000	1,000	1,000	1,000	1,000	1,000
Fines	40	40	40	40	40	40	240
Charges for use of equipment	70	70	70	70	70	70	420
Rent of rooms	150	150	150	150	150	150	900
MONTHLY CASH REQUIREMENT	11,460	9,404	9,170	13,420	7,938	7,800	59,192
	11,720	9,664	9,430	13,680	8,198	8,060	60,752
CASH OUTFLOW:							
Books	8,640	6,210	5,560	9,600	4,500	4,500	39,010
Periodicals and journals	620	810	730	670	760	840	4,430
Salaries	700	700	850	700	700	700	4,350
N.H.I.	10	10	10	10	10	10	60
Repairs and renewals	150	150	300	300	300	150	1,350
Printing and stationery	140	210	330	180	190	200	1,250
Information retrieval services	150	450	450	450	450	450	2,400
Motor expenses	140	140	140	140	140	140	840
Heat and light	–	194	–	–	358	–	552
Rates	380	–	–	–	–	–	380
Incidentals	250	250	250	250	250	250	1,500
Equipment rental	540	540	540	540	540	540	3,240
Capital Expenditure	–	–	270	840	–	280	1,390
	11,720	9,664	9,430	13,680	8,198	8,060	60,752
CUMULATIVE CASH REQUIREMENT	11,460	20,864	30,034	43,454	51,392	59,192	59,192

Draft Definitions: information and library needs, wants, demands and uses: a comment

Norman Roberts

Postgraduate School of Librarianship and
Information Science, Sheffield

INFORMATION SCIENCE HAS existed in an uneasy, suspended, state of becoming for an uncomfortable number of years. Yet, despite a stubborn refusal to be born whole, hope for the imminent emergence of a fully fledged 'science' remains as fresh as ever. Conferences willingly consider and reconsider the question—what is information science? While some are content to search for the essence that is information science, others are convinced that they have already found it; there is no shortage of teachers ready to assert that information science consists of a particular (usually their own) mix of subjects. It is not uncommon to meet wandering, rather bemused, physicists, chemists and engineers eager to argue that they, too, have discovered something called information science. Members of this latter group may be uncertain of the precise nature of their discovery but are willing to aver that whatever it is it is not librarianship. In this struggle to induce the registrable birth of information science comparatively little attention is paid to the distinct social science bias of this most eclectic of 'sciences'. This comparative neglect has persisted, surprisingly, despite a shared characteristic of fundamental significance. Both areas are noted for their incredible looseness of terminology and their confused and confusing professional thought and writing.

Faced with terminological imprecision social scientists have devoted considerable efforts to the solving of definitional problems[1] and asking a 'large number of meaning questions'.[2] This type of question also abounds in information science—what is need? what is use? what is benefit? what is information? what is productivity? etc. Unfortunately, in information science, less effort has been expended upon the formulation of acceptable definitions of fundamental concepts, despite the scathing comment of such powerful critics as Fairthorne.[3] While it may be naïve to expect the development of 'sufficiently precise theoretical expressions to guarantee unequivocal actions on the basis of those expressions'[4] it remains that progress in information science requires greater definitional effort and more rigorous definitions of concepts. It is for this reason that Maurice Line's *Draft Definitions*[5] for the terminology of user studies is to be commended. An important problem has been recognized and tackled. However, the *Draft Definitions* were obviously proposed as a basis for discussion. This comment is an attempt to consider certain of the issues raised by Line's proposals.

Aslib Proceedings 27 (7), July 1975, pp. 308–313. Printed in Great Britain

The proposed definitions seem to represent an effort at rationalizing a number of existing, eccentric usages rather than the development of a new terminology with assigned meanings of greater precision. This is an obvious advance but perhaps more is needed? Even after re-definition the five terms 'need', 'want', 'demand', 'use' and 'requirement' retain a critical lack of exclusivity. 'Requirement' may mean a 'need' or a 'want' or a 'demand'; it may also be employed, it seems, to describe a 'need' and a 'want' and a 'demand'. A 'need' may or may not be a 'want'; a 'want' may or may not be a 'need'. Both a 'want' and a 'need' may be appropriate, or inappropriate, to an individual's information situation and may or may not be expressed in some consequent form of demand action. This confusion of meanings and relationships suggests that improved clarity of definition may require a more radical approach to the revision of terminology than is proposed by Line.

As a beginning it might simplify matters if all stages preliminary to use were regarded as various manifestations of demand, and that demand itself be understood as a relative concept implying a library or information system of which demands may be made. With this idea in mind it becomes possible to abandon the use of the term 'requirement' in the senses suggested by Line. The arguments employed to justify the utility of this particular term could apply, with greater force, to resisting its use. 'Requirement' is too closely related to 'need', 'want' and 'demand' to be regarded as an acceptable synonym for any one, or all, of these individual terms. This similarity of meaning also limits the usefulness of the term at the higher level of generality, *i.e.* as the comprehensive term including all the meanings imputed to 'need', 'want' and 'demand'. There are obvious drawbacks in the use of a single term to describe both the generators of 'demand' (*i.e.* 'want' and 'need') and 'demand' itself. Yet the idea of the total size of demand generated by various levels of 'need' and 'want', whether voiced or unvoiced, acted upon or not, appropriate or inappropriate, is of theoretical or conceptual significance to the librarian, or manager, and should be capable of expression. 'Requirement' does not convey the comprehending nature of this idea: Total Potential Demand is suggested as being more descriptive and accurate. In a formal sense Total Potential Demand may be defined as the sum of all individual and group demands that *could* be made upon the materials, services and personnel of a library/information unit. Potential Demand (as is also implied by Line) may result in demand action, or may not, it may be voiced, or it may not, it may be appropriate, or it may not, it may be perceived, or it may not. In practice Total Potential Demand is hardly likely to be capable of precise measurement. But, even on the notional level, it does serve a useful purpose as a reminder and caution against the use of actual demand, alone, as an acceptable criterion of service effectiveness.

The level of Total Potential Demand confronting a library/information system, at any given time, is dependent upon the working of many factors *e.g.* the type of work undertaken by the user, group user tolerance levels, the level of user expectation itself, perhaps, a reflection of type and level of services offered by the library/information unit, etc. These factors, and others, operate upon individuals in various ways and with varying results but with the general outcome that, in some fashion, individual potential demand is conditioned, fashioned or influenced. Such influential forces may be termed potential demand creating factors. In Line's terminology these factors combine into individual 'needs' and 'wants' bearing in mind that 'needs' and 'wants', applied to different individuals, contain varying proportions and intensities of potential demand creating factors. In addition to comprehending these varied factors the terms 'need' and 'want' also accord a primitive priority rating to the two derived classes of potential demand *i.e.* the 'ought to have' class and 'would like to have' class. The use of single terms to describe both manifestation and priority probably complicates the situation. Any proposal for a new terminology should attempt a simplification by disentangling the two meanings and by substituting for 'need' and 'want' accurate descriptive terms devoid of value content. Priority, or intensity, aspects of potential demand should be considered a separate problem.

On this basis the potential demand creating factors may be regarded as 'producing' Individual Potential Demand *i.e.* the sum of demands that the individual user believes *could* be made upon the materials, services and personnel of a library/information unit. By extension it is possible also to think usefully in terms of Group Potential Demand. Within a defined body of system users the sum of Individual Potential Demands would equal Total Potential Demand. Basically the notion of potential demand, at whatever level, expresses a concern for the extreme limits of service and resource provision. It need not be emphasized that the shape and size of potential demand are probably seen quite differently by the librarian and the user. In this difference lie the seeds of disappointed expectations, misunderstandings and dissatisfaction on both sides of the library counter.

As the current use of 'need' and 'want' suggests, different Individual Potential Demands possess varying priority ratings both from an individual user's standpoint and from the librarian's. Essentially this rating is an individual, subjective, assessment which often attains a degree of objectivity through reinforcing numbers of consensus. This is another area of possible eventual friction. A potential demand may be invested with a high degree of priority by the library user but may not be so assessed by the librarian. In this situation it seems necessary to recognize that the 'ought' and 'would like' priority classes are inadequate for analytical, policy or practical purposes. The establishment of priority for the librarian and for the library user, is a complex activity and should be so recognized by the employment of a greater number of priority gradings. Once established these gradings could be employed by librarians and library users to qualify all forms of demand.

A most interesting characteristic of Potential Demand is that it is rarely fully realized. Only rarely is potential demand wholly transformed into actual demands upon the library/information system. The reasons why this should be so are not germane to this particular discussion but insofar as they explain the non-use of libraries they are of vital interest to librarians intent upon effective use of available resources. This shortfall must be explicitly acknowledged for analytical purposes. Line's idea of demand as 'what an individual asks for' is clearly an inadequate definition if taken literally. For example, librarians have devoted much time and ingenuity to evolving and organizing systems that make 'asking', or articulating a demand, unnecessary in the literal sense. In these circumstances a demand which is satisfied by 'asking' or through an intermediary cannot sensibly be viewed differently to a demand that is satisfied by the library user following his own personal trail of discovery. The definition 'what an individual asks for' does not make this sufficiently clear. In addition Line's 'demand' does not convey fully the idea of expressed and non-expressed demand.

The analytical imprecision associated with Line's use of 'demand' could be clarified by accepting that Total Potential Demand is transformed, in time, into Expressed and Non-Expressed Demand. Expressed Demand must be understood not only in terms of 'what the individual asks for' but also to include those forms of demand which a library user makes upon provided services directly *i.e.* without articulation or benefit of intermediary. The same forces may have impelled one person to 'ask' a librarian, another to use the devices provided by the library to help himself but, in both cases, demand has resulted in action. These actions are Expressed Demands. The various meanings implied in this definition include accidental discovery of a demand and browsing. In more formal language Expressed Demand may be defined as an action taken by a library or information system user to acquire data, information or documents from, or through the agency of, that library or information system. Action in this sense may be personal or taken on behalf of the library user by a member of library staff or any other appointed deputy.

Not all Total Potential Demand is transformed into Expressed Demand. Library services, notwithstanding the encouraging rhetoric of librarians, would soon collapse were this not so. Although the reasons for this situation are of great operational significance and primary management concern they cannot be discussed in this short note. What must be done, however, is to recognize that a proportion of potential demand, for a number of reasons, does not reach the level of expression but lies dormant. There are techniques for awakening and making expressive previously dormant demands so Latent Demand might be used to describe this unexpressed demand. Expressed and Latent Demand together exhaust Total Potential Demand.

Demand may be expressed as action or articulation. Experience assures us that not all demand so expressed is satisfied. The librarian's view of a legitimate expressed demand may, and probably does, differ from that of the library user; in such a conflict the librarian's view is likely to prevail, resulting in the non-satisfaction of an expressed demand. A library user may fail to discover the material he needs; whatever the reason for this failure the result is the same—non-satisfaction. An inadequate library budget is a likely source of unsatisfied Expressed Demand. For whatever reason (and there are many) only a proportion of Expressed Demand is satisfied; this proportion may be designated Satisfied Demand, the remainder Non-Satisfied Demand. This ratio is a crucial indicator of system effectiveness.

The final stage in this demand sequence is 'use'; a term difficult to replace despite its inadequacies. Line's definition of this term ('what an individual actually uses') would appear to reflect the library user's viewpoint and, in this sense, 'use' is a function of demand satisfaction *i.e.* demand satisfaction precedes 'use'. It is necessary to point out that the library, too, has a 'use' viewpoint and that it does not always coincide with that of the library user. It seems clear that an individual who reads, views or listens to library materials is 'using' that material in the expected way *i.e.* an expressed demand has been satisfied and 'use' has followed. Not all Satisfied Demand results in individual 'use'. It seems equally obvious that the preliminary stage of borrowing the material or taking a book off the shelf does not constitute 'use' from the individual's standpoint. This distinction may have less significance for the librarian. The provision of material which is borrowable is one of the services offered by the library; borrowing a book may quite properly be regarded as a 'use' of the service; what the individual intends to do with borrowed material is not the concern of the librarian. The overlapping meanings and ambiguities associated with 'use' make vigorous definition and limitation essential in the research situation. This has not always been evident in published work. The majority of user studies have concentrated upon the librarian's version of 'use' *i.e.* an interaction with a provided service; comparatively little work has been devoted to the 'use' that is made of what the services provide. Ideally there may be need for terms to convey these 'use' distinctions; in practice equally expressive replacement terms do not readily come to mind. A compromise solution would be to insist upon introductory definition, or qualification, of the term.

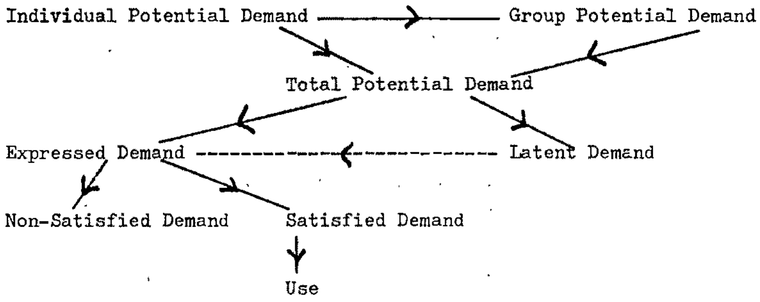


FIGURE 1

To sum up: for a variety of reasons (work, recreation, expectation, etc.) an individual develops a mental image of the demands he could make upon a specific library/information system. This, the first step in the demand sequence, is Individual Potential Demand. For any individual it is composed of specific demands of varying priorities sometimes based upon misinformation and misunderstanding. The Individual Potential Demand of library users and potential users may be summed, at least theoretically, to give Total Potential Demand. Only a fraction of Total Potential Demand is transformed into the concrete action of Expressed Demand (complement = Latent Demand); only a fraction of this demand is transformed into Satisfied Demand (complement = Non-Satisfied Demand) and only a fraction of Satisfied Demand finally results in Individual Use. The relationships between the proposed terms may be diagrammed as in Figure 1.

These proposals (a) increase the explicitness of the 'demand' vocabulary, (b) provide a more systematic approach to the individual's demand sequence, (c) reduce the confusion attendant upon the use of the currently favoured terms —'need', 'want' and 'requirement'. As with all new terminologies, however, there are drawbacks. In this instance both unfamiliarity and a degree of cumbrousness have to be contended with. The former problem could be overcome in time and with the cooperation of research workers; the inelegance would remain—but this would be a small price to pay for the needed precision.

REFERENCES

1 LACHENMEYER, C. W. *The essence of social research.* Collier-Macmillan, 1973.
2 *ibid.*
3 FAIRTHORNE, R.A. 'Few intelligent groups can have achieved so slovenly and misleading a vocabulary in so short a time. Few intelligent groups can have cared less.' Review. *Journal of Documentation,* 21 (3), September 1965, p. 201–5.
4 LACHENMEYER, C. W. *op. cit.*
5 LINE, M. B. Draft definitions: information and library needs, wants, demands and uses. *Aslib Proceedings,* **26** (2), February 1974, p. 87.

Draft Definitions: a further comment

It is true that my 'Draft Definitions' were put foward as a basis for discussion, though I hoped that some consensus might be reached quickly rather than that I was initiating a long debate. It is true also that I was trying to tidy up an existing mess by defining existing terms more precisely, on the same principle that it is more practical to improve the use of the English language than to try to invent a new one. Mr Roberts's terms do have the great advantage that if they are used everyone will know what they mean, whereas it is not possible to know if my terms are being used in my sense or not, unless the author tells us. However, this advantage may be more than outweighed by the probability that no one will use Mr Roberts's terms.

I see no reason why definitions of this kind should be mutually exclusive. 'Needs' and 'wants' can still mean different things, even though a particular want may also be a particular need. A term such as 'requirement' which covers all the rest also seems to me useful.

I believe that a person can have a need that has to be stimulated, or perhaps even satisfied, in order to be recognized by the person himself. Mr Roberts's terminology does not allow a distinction between unfelt and felt need (= want, in my terminology). In practice, this distinction is in my view necessary, as it can radically affect a library's policy if it detects and acts upon the unfelt needs of its clientele.

M.B.LINE
British Library Lending Division

BRIEF REVIEWS

BOLTON, K. M. *ed.* Current accounting literature 1973: compiled at the library of the Institute of Chartered Accountants in England and Wales. London, Mansell, 1974. 292 pp. £13.00. (ISBN 0 7201 0455 6).

This is the second supplement to the listing 'of books, pamphlets and periodicals of current interest', issued by the Institute of Chartered Accountants in England and Wales, as *Current Accounting Literature 1971*. In the compilation of the supplements the help of other major accounting libraries in this country has been engaged, each participating library notifying the compiler of accessions during the year in question. A list of participating libraries, six in all in the case of this supplement, is given and locations for publications are appended to the main entries in the Author Catalogue, the first major section of the publication. Perhaps 'name catalogue' would be a better description of this section as full publication details are given not only under the author but also under the issuing organization where applicable. Title entries also appear where no name is associated with the publication. A Universal Decimal Classification number is appended to each of the main entries of publications held in the Compiling Library.

The second major part of this bibliography comprises the Subject Catalogue, arranged by UDC and its concomitant Subject Index, which is to be commended for its detail. Indeed it is used to classify periodical articles in the Library, thus an entry in the Index does not necessarily imply there are any publications listed on that particular subject. Full publication details are given in the Subject Index although locations are not included.

Serial publications are listed in the Periodicals Catalogue with the address of the publisher and frequency, and in the Serial Publications Catalogue which includes all other publications appearing annually or irregularly. Libraries holding at least one issue are indicated. The volume is completed by two appendixes, I, Statute and Case Law holdings not catalogued separately, and II, Statistical services and other sources of financial information.

According to the publishers this supplement lists 2,000 publications acquired during 1973 with a subject coverage not only of accountancy but peripheral subjects of interest to the accountant, for example computer technology, statistical sampling, finance in its widest sense, taxation, law and management. This publication will prove, as no doubt the earlier publications have done, of great interest and use not only to the specialists but also to a wide range of more general libraries.

HOUGHTON, B. Scientific periodicals: their historical development, characteristics and control. London, Bingley, 1975. 135 pp. £3.75. (ISBN 0 85157 186 7)

Historical developments are traced from the publication of the first scientific journal, the *Journal des Scavans,* in 1665. Today, scientific and technical journals appear in several forms according to their publishing origin and their functions. Some problems of the scientific journal include delays in the papers' publication, restrictions on the length of papers, systems of refereeing etc.; alternative methods of disseminating and communicating information are discussed, including the Information Exchange Group experiment which flourished in the U.S. between 1961 and 1967. Access to the journal literature through various types of guides, abstracts and abstracting services is explained; lists of guides and titles are given, grouped by subject area and country, and bibliographies which list abstracting and indexing services. The characteristics of periodical literature are discussed, including their growth which is estimated, and obsolescence considering usage and citation patterns.

RIGBY, M. Computers and the UDC: a decade of progress 1963–1973. The Hague, FID, 1974. 108 pp. (ISBN 92 66 00523 1)

The purpose of this report is to document the history and activities of the FID/CCC-M (Subcommittee on Mechanization of the UDC) from 1963 to the present day: to review various pilot projects and experimental and operational systems involving the UDC and its manipulation by tabulators or electronic computers; and to describe the various types of applications of machines to UDC arrangement, filing, storage, retrieval, display or communication. The technical and economic limitations as well as the benefits involved with using machines to control UDC schedule maintenance or use are pointed out. A bibliography on mechanization and the UDC is included. Descriptions of individual projects or systems are given arranged by country. No attempt has been made to give details of design or programming: for such details one must write to the authors of the respective systems.

Choose your carpets with confidence

from DODSON BULL

UP TO 30% DISCOUNT

ALL LEADING BRANDS

Wilton ● Axminster ● Oriental ● Tufted

● All makes available with full Manufacturers' Guarantees
● Free delivery in U K ● Expert fitting service available

£200,000 carpets on display

in our extensive London and provincial showrooms

Free brochure on request to Dept. ALB

DODSON-BULL CARPET CO. LTD.

LONDON: 5 & 6, Old Bailey, EC4M 7JD. Tel: 01-248 7971
BIRMINGHAM: 164, Edmund St., B3 2HB. Tel: (021) 236 5862
BOURNEMOUTH: 268, Old Christchurch Rd., BH1 1PH. Tel: 21249
BRIGHTON: 2-5, North Road, BN1 1YA. Tel: 66402
BRISTOL 2-3 Royal London Hse, Queen Charlotte St: BS1 4EX. Tel: 28857
EXETER: 197, Fore St., EX4 3AT. Tel: 82019
GLASGOW: 166, Howard St., G1 4HA. Tel: (041) 221 3278
LEEDS: 12, Great George St., LS1 3DW. Tel: 41451
MANCHESTER: 55-61, Lever St., M1 1DE. Tel: (061) 236 3687/8/9
NEWCASTLE-upon-TYNE: 90-92, Pilgrim St., NE1 6SG. Tel: 20321/21428
WESTCLIFF-on-SEA: 498, London Rd., SS0 9LG. Tel: Southend 46369
Open: 9.00-5.30 Mon.-Fri., Sat. 9.00-12.00 (Manchester 9.00-4.00)

Computer Provision in British Libraries

Jane Wainwright

Price: £5.75

£4.60 to Aslib members

SBN: 85142 069 9

Index to Theses

accepted for higher degrees in the universities of Great Britain and Ireland

Volume XXIII (1972/3)

edited by **G. M. Paterson** and **J. E. Hardy**

Price: £10.00

£8.50 to Aslib members

SBN: 85142 068 0

Handbook of Special Librarianship and Information Work

4th edition

edited by **W. E. Batten**

Orders may be placed now for this new edition of the well-known *Handbook*, to be published in the Autumn

3 Belgrave Square London SW1X 8PL

Aslib Publications

7 NOV [illegible]

British Technology Index

CURRENT SUBJECT GUIDE TO BRITISH TECHNICAL JOURNALS

FOR TRACING AND RECALL

of $\left\{\begin{array}{l}\text{specific}\\\text{recent}\end{array}\right\}$ information

in the Field of Applied Science, Engineering and Manufacturing Technology

Monthly Parts and Annual Volume

THE LIBRARY ASSOCIATION

7 Ridgmount St. Store St. London, WC1 7AE

(Phone: 01-636 7543)

SECOND EDITION

Encyclopedia of Governmental Advisory Organizations

A Reference Guide to Federal Agency, Interagency, and Government-Related Boards, Committees, Councils, Conferences, and Other Similar Units Serving in an Advisory, Consultative, or Investigative Capacity.

EDITORS: Linda E. Sullivan and Anthony T. Kruzas

JUST PUBLISHED

The 1975 edition of the *Encyclopedia of Governmental Advisory Organizations* covers 2,678 groups functioning in an advisory capacity to the President and to various departments, bureaus, and committees of the government. Each entry lists the personnel, origin, activities, purpose, and affiliation of the advisory group.

This clothbound volume contains updated and enlarged listings from the first edition, as well as fresh listings. Some previous entries have been consolidated; duplications have been eliminated; all have been reviewed and updated as needed. Detailed listings for approximately 200 additional committees are included, many of them for such recent and topical groups as:

- ***Commission on CIA Activities within the United States***
- ***Citizens' Advisory Committee to Fight Inflation***
- ***Energy Research and Development Advisory Council***
- ***The Commission on Federal Paperwork***

The thorough alphabetical and key word index aids convenient and flexible use of EGAO itself and also refers users to the *Congressional Record* for all congressional committees and their subcommittees. Cross-references are also provided to the *United States Government Manual* for government departments, offices, and bureaus not considered advisory committees, but whose names suggest they are.

2 EDITION $75

EGAO, like all Gale publications, is available on 30-day approval. Subscribers may also request Standing Order Service in order to save time and paperwork.

To keep the ENCYCLOPEDIA OF GOVERNMENTAL ADVISORY ORGANIZATIONS current, order NEW GOVERNMENTAL ADVISORY ORGANIZATIONS, a periodical supplement which reports on newly established advisory groups during the period between EGAO editions. Inter-edition subscription, with binder, $65.00.

GALE RESEARCH CO. BOOK TOWER
DETROIT, MICH. 48226

Published in England by Aslib, 3 Belgrave Square, London SW1X 8PL
Printed at the Alden Press, Oxford

7 [illegible] 1975

ISSN 0001 2

Aslib

Proceeding

THE COMMUNICATORS

Communication: a key library management problem
John Blagden

Communication within the organization
C. A. Lumsdon

The effect on an organization of communication with the outside world
Andrew Robertson

8TH ASLIB ANNUAL LECTURE

Information communication and management
Sir Montague Finniston

AUGUST 1975
VOL. 27, NO. 8

CALCUTTA ★ CENTRAL

Industrial Catalogues and Standards on Microfilm

An expensive and time consuming task that is better left to specialists.

For over ten years we've been providing cost-effective information services to commerce, universities, colleges, research institutes, government departments, and public libraries in the UK.. You can get more details if you —

Telephone Bracknell 26311 and ask for Stafford Napier.

Chemical Engineering Index
Electronic Engineering Index
Engineering Components &
Materials Index
Materials Handling Index
Laboratory Equipment Index
British Standards Microfile
Defence Standards Microfile

Technical Indexes Limited, Easthampstead Road, Bracknell, Berkshire,

Aslib Proceedings

VOLUME 27 AUGUST 1975 NUMBER 8

© 1975 Aslib and contributors

Aslib Proceedings *is published monthly and supplied free to members of Aslib. Subscription rates are £18.00 annually to non-members, or £9.00 to Aslib members requiring additional copies. Single copies £1.70, or 85p to members.*

Further information about Aslib's services and membership rates will be supplied on application to the Director, Aslib, 3 Belgrave Square, London SW1X 8PL. Tel: 01-235 5050. Telex 23667; answer-back, Aslib London.

Notes for contributors

Aslib Proceedings now accepts contributed papers in addition to those presented at Aslib meetings and conferences. They should be of a practical nature and of some relevance to problems encountered in the everyday operation of library and information units, or services. Other kinds of contribution which will be considered for inclusion are short notes on new information units or special libraries; the introduction of new techniques or systems in existing libraries where these may be of general interest; equipment designed by members for special purposes and put into operation in their own organizations; and objective reports on experience with new 'packaged' commercially available information services.

Contributions, which should be typewritten, double spaced, single-sided on A4 paper, and not more than 3,000 words in length, should be addressed to the Editor, *Aslib Proceedings*, 3 Belgrave Square, London SW1X 8PL. If possible, authors should include a summary of up to 200 words with the typescript. Authors will receive twenty-five offprints of their article free of charge.

The Communicators

Proceedings of the Symposium held at the Geological Society of London, 4th March 1975

THIS ASLIB SYMPOSIUM focused attention on the communication of information with an organization, using both external and internal information sources.

Librarians and Information Officers have always been aware of the need for effective communication with their users. Good management of these service units is equally dependent on the communication of information about the system's performance. This, in turn, emphasizes the need for good patterns of communication at all levels within the organization so that people know what they should be doing, and how well they are achieving the required results. Additionally, there is an increasing need for organizational self-awareness, and the information specialist has an opportunity, if not a responsibility, to contribute to the creation of this state within his parent organization.

This was a broad subject for a one-day symposium, and the stimulating contributions from the speakers met an equally vital awareness in the participants of the importance of communication to organizational life generally, and in Library and Information units in particular.

We are pleased to be able to give the text of three of the papers in this issue of *Aslib Proceedings*, so that the interest reflected in the lively discussions that followed the speakers' presentations may be shared by a wider audience. The level of concern expressed with the task, problem, challenge of effective communication encourages us to predict a continuing exploration of the concepts and themes developed on this occasion.

Communication: a key library management problem

John Blagden

Access (Architects Central Constructional Engineering Surveying Service), Greater London Council

Paper presented at an Aslib symposium on The Communicators, Geological Society of London, 4th March 1975

Introduction

I RECENTLY GAVE a talk on audio visual aids and rather foolishly decided to have my talk accompanied by slides. I spent most of the time on the platform either making statements such as you should at this juncture be looking at a shot of Ronan point collapsing rather than a blank screen or watching rather helplessly as twenty or so slides hurtled through the projector into oblivion.

I now have the same uneasy feeling when giving a talk about communication and feel at one with F. L. Lucas when he stated 'In some modern literature there has appeared a tendency to replace communication by a private maundering to oneself which shall inspire one's audience to maunder privately to themselves, rather as if the author handed round a box of drugged cigarettes'. Bringing this argument a little closer to home as to why the shoemaker's son doesn't wear shoes, the theme of my maundering this morning is going to be why is it that, as librarians, we do not capitalize on experience in other disciplines to tackle the crucial but neglected problems that our work poses.

Current measures of effectiveness

Let us examine some of the measures that are used to justify our existence.

Use

Most libraries justify their existence by collecting detailed statistics of loans, enquiries, photocopies etc. and assume that as demand increases so does the contribution to the health of the organization which one assumes the library is supposed to be serving. This assumption is based, in my view, on a number of misunderstandings of the role of library and information services.

Objectives

First it assumes that libraries are in the book distribution/information dissemination/photocopy production business. Clearly in my view we are not, and Theodore Levitt[1] put it very nicely over fifteen years ago:

Aslib Proceedings, 27 (8), August 1975, p. 319–26. Printed in Great Britain

> Every major industry was once a growth industry. But some are now riding away with growth enthusiasm and others are very much in the shadow of decline. Others which are thought of as seasoned growth industries have actually stopped growing. In every case the reason growth is threatened, slowed, or stopped is not because the market is saturated, it is because there has been a failure of management.
>
> The failure is at the top. The executives responsible in the last analysis are those who deal with broad aims and policies. Thus, the railroads did not stop growing because the need for passenger and freight transportation declined. That grew. The railroads are in trouble today not because the need was filled by others (cars, trucks, aeroplanes, even telephones), but because it was not filled by the railroads themselves. They let others take customers away from them because they assumed to be in the railroad business, rather than in the transportation business. The reason they defined their industry wrong was because they were railroad orientated instead of transportation orientated, they were product orientated instead of customer orientated.

Customer orientation does not, however, mean saying 'good morning' nicely to your customers, or enquiring on the health of the research director's budgerigar. What it does mean is establishing the information needs of your customers in terms of corporate goals and monitoring how successful you are in meeting these needs.

The monitoring process is essentially a communication problem and statistics of use do not answer three fundamental library management questions: (a) was the information disseminated read by the enquirer? (b) if yes, did this reading enrich the thinking of the enquirer? (c) if yes, was this enrichment in accord with the goals of the organization which the library is serving, *i.e.*, did it produce a better/quicker decision?

Use at best is therefore an intermediate measure of effectiveness, and particularly in the present economic climate even public libraries cannot rely on the 'reading is a good thing' argument. For example, it may be more cost beneficial to provide the house-bound with television sets rather than a door-to-door book service.

Even accepting that at present this is the hardest evidence that most of us have available, quite often we are unable to:

(a) determine our degree of market penetration both globally and broken down by individual customer groups
(b) ascertain how much is repeat business/new business
(c) build up profiles of our user in terms of age, experience, etc.
(d) isolate that portion of our stock that probably accounts for a high proportion of the use. I suspect that the normal Pareto distribution follows, *i.e.*, that 20 per cent of the stock will account for 80 per cent of the use. Input often also follows this same pattern, *e.g.*, in a peek-a-boo system the average number of keywords per document could be as high as fifteen and yet the average number searched under as low as three. In other words, a great deal of our effort is wasted even in terms of the expressed demand.

Let me quickly dispose of some of the other measures that have been used, none of which remotely come near to answering the fundamental question as to what happens to the information that we so blithely promote.

Charging

Some libraries in the private sector directly charge for their services, and many libraries indirectly do in that they are treated as an overhead and then the charge for this service is allocated to the various profit centres within the organization. The allocation of overheads has always been a difficult management problem as a recent BIM survey[2] indicates. What users are prepared to pay for, especially when it is not their money, is not a particularly effective measure in practice despite its initial hard-nosed attractions.

User studies

User studies of the non-behavioural kind employing questionnaires or interviews do not necessarily provide very reliable evidence because: (a) the difficulties of eliminating bias in the study; (b) respondents tend to give you the answers they believe you want; (c) a reluctance to criticize; (d) answers may be based on last week's experience of the service rather than the whole period which the survey is hoping to cover; (e) the complex scaling problems that attitude measurements present; (f) genuine satisfaction or dissatisfaction with the information that was provided could be for information not connected with the work of the organization; (g) sampling problems; (h) difficulty in reaching the non-user.

Questionnaires

Let me cite some examples from questionnaires that I have received in the last few months.

One was supposedly a random sample and yet three libraries within the Greater London Council completed this particular questionnaire. Information and library services for local government councillors and officers is a relatively new development so the 'random' sample produces three such libraries all from the same local authority!

Three members of my staff had exactly the same attitude to an issue posed in a questionnaire, but because of ambiguity in the wording of the question all three answered the question differently.

I was recently asked how well I thought I was paid for the work I do. Now there are three ways of answering this question: (a) in the context of the job market, *i.e.*, what other librarians are getting paid for similar work; (b) comparing my pay with the salary structure within the organization in which I work; (c) comparing my pay with concepts of social justice, *i.e.*, the pay of coalminers and Indian peasants.

A training investigation asked how long should a short course be?

I recently saw a scale which was attempting to elicit user reaction to an information service: Very Good/Good/Satisfactory/Slow/Very Slow. Clearly one can provide a very good but very slow service.

Questionnaires are attempting to establish facts but in many cases the respondent with the best will in the world will not be able to satisfactorily answer this type of question. Examples are: how do you spend your time? How much time does the information and library service save? I believe it was Tom

Allen[3] who checked answers to a questionnaire against actual behaviour and found little or no connection between the two.

In short, questionnaires tend to be used because they are relatively inexpensive, but it is my contention that they are frequently unsuitable for the purposes for which they are used; if we are going to use them let us adopt a more professional approach to their design.

Hansen[4] sums it up nicely when she states:

> The quantitative assessments based upon direct user comments in the form of questionnaires, interviews etc., have in our studies been far less important than the results of unobtrusive analysis. It has turned out to be a very time-consuming and slow process to get the responses back from the potential users. The results are rarely representative for the whole of the user community due to the lack of response from the 50% 'non-believers', and the range of opinions expressed by the remaining 50% tends to be so wide that a quantitative analysis hardly is of any help in the decision-making process.

She goes on to say:

> First of all, it is popular to involve the users in the decisions in all parts of society from kindergartens and upwards, and I do not myself feel quite at ease by suggesting something as undemocratic as planning a system over the heads of the potential users. On the other hand, I feel rather comforted by the fact, that the potential users of library and information services are not very eager to express their wishes and, of course, it is obvious that any explicit wishes expressed by potential users would be warmly welcomed and considered in the decision-making-process.
>
> A more serious point is, of course, how one can know the needs of the users without asking directly. My argument here is, that I think that it in most cases is possible to get an impression of the needs by discussions with a few selected users thus making a sort of qualitative analysis instead of a quantitative. Further, it is possible to get an impression of expressed and unexpressed needs by statistical observations which do not require direct involvement of the users and, therefore, become less expensive, less time-consuming and less biased by personal opinions. Finally, an excellent way for the information scientist of getting acquainted with the weakness of the information system is regularly to switch over into the role as user of information, as this very clearly shows in which respects the information supply is satisfactory and where it needs to be improved.

Measures for the future

I want, therefore, to take up the Hansen point of qualitative analysis, because my experience, as I have already indicated, is that questionnaires are used primarily because they are cheap to administer, not because they are necessarily the best tool for the job.

I would like to examine five techniques that I believe could help answer these three key library management questions to which I have already referred.

1. Advertising effectiveness techniques

Those that buy an advertiser's services wish to know the answers to the following questions.

> Has the customer or potential customer been exposed to the advertisement?
> Did this change customer behaviour, *i.e.*, by reinforcing or altering buying habits?

Now as I see it, and I am sure Colin Offer and Mr Dunbar of J. Walter Thompson will correct me if I am wrong, in the early days the monitoring of advertising tended to concentrate on recall, but as Professor Haskins[5] pointed out, 'Learning and recall of factual information from mass communications does occur. However recall and retention measures seem at best irrelevant to the ultimate effects desired of changing of attitudes and behaviour'.

So that although those monitoring advertising expenditure had got well beyond the stage of library managers in 1964, *i.e.*, they were able to measure what information was retained in the heads of those exposed to an advertisement, it signified little or nothing in terms of ultimate advertising goals.

I believe, however, that the work of J. E. Clucas[6] goes even further down the road of monitoring ultimately advertising effectiveness and have no doubt that this technique could also be applied to library management problems.

Essentially the technique consists of inviting a carefully selected sample audience to participate in film testing. They are then exposed to commercials which are only part of a programme of films, so that as far as possible an unselfconscious exposure situation is created. Audience members are asked to say not only what they saw in the advertisement but what was going through their minds when these scenes were shown. This technique has been applied not only to printed advertisements but also to printed publicity, some of which is of a technical nature.

The secret of the success of the technique is that it simulates closely the real life situation in as natural a way as possible. Then, using the trigger mechanism in the brain, recreates the event to discover what the person exposed to the advertisement was actually thinking at the time. It identifies the blind spots in the communication process and the effect of the pictures that are registered on the conscious mind of the reader or viewer. I would rather have one Clucas analysis of one of my readers than perhaps all the questionnaires in the Aslib Research Department.

2. *Observation*

We know little or nothing about the real problems that our users and non-users face in their work situations, except as that possibly reflected in the use of our libraries. Again in-depth behavioural studies, preferably by trained behavioural scientists recording in a neutral non-interventionist way what happens, for example, in an architectural design group. Other techniques that spring to mind are self recording diary techniques, which I believe Aslib have used, or activity sampling. In all cases the objective would be to establish what actually happens rather than what we think is happening, thereby hopefully ensuring that the library service concentrates on the real road blocks to effective decision making.

3. *Organizational experience*

Many libraries are repositories of a firm's experience, technical reports, client reports, etc. In many cases, however, this is a retrospective process, *i.e.*, when the project is completed so the report is filed in the library. At McKinsey the information staff collected at regular intervals information about the project *as it was continuing*. Much of this was factual information, but we were also concerned to establish what was enriching the experience of the organization, what particular problems has the team been faced with on the study, *i.e.*, emphasizing the unusual and non-routine. This often meant that library staff were able to suggest information that could overcome or help solve these problems. This system was part of an internal management information system, and it is rare for library services to be either formally or even informally plugged into the MIS.

Thomas Shotwell[7] who conducted a similar study to the now famous Allen investigation and who, incidentally, came up with rather different conclusions, produced a rather sad byproduct of his research:

> In our environment, severe isolation and strong involvement appeared to be functions of personality, academic degree, department to which assigned and length of time with the firm—roughly in descending order as listed. Positions in the organisational structure appeared to be of only minor importance. The seven persons who communicated most frequently with other staff members were young to middle-aged doctorate holders who had been with the firm more than two years. The five most isolated persons were B.S. or M.S. degree holders who had been with the firm less than four years. Two of these five were organic chemists, two were microbiologists working in quality assurance and one was the *library manager*.

4. Broadcasting

The BBC's Solution

The BBC face a scarce resource problem which is similar to that of the library service, especially public and university libraries. Brian Emmett,[8] head of audience research at the BBC, summarized this dilemma in 1968.

> In the future, it may be possible to provide facilities for recording all broadcast material in the home and thus enable listeners and viewers to select not only from different channels but also from different times, but even this would not absolve the broadcasting authorities responsible for the various channels from the need to make decisions about how much to broadcast of each of the many different kinds of programs that they could transmit. One suggested solution to the problem seeks to avoid the issue altogether. It runs rather like this: It is the broadcasters' job to organise a kind of bazaar or supermarket in which the full range of commodities available is displayed to the prospective purchaser. Unfortunately, no broadcasting system could possibly display all possible goods—at least in any time period that would seem comprehensible to the listener or viewer. Take plays. It is doubtful if all Shakespeare, Moliere, Shaw and Brecht could be presented in even a two- or three-year period, let alone the enormous quantity of less acclaimed works or the products of contemporary dramatists and those who write especially for radio and TV. Similar impossibilities arise with music, with current affairs, or indeed with practically any type of output. *So a choice must be made, explicitly or not, and audience maximisation, it is contended, is an inadequate criterion to guide the choice.*

The BBC are developing a computer model to deal with this complex option problem.

5. TV

Some interesting research has been completed by Blumler[9], Brown and McQuail (1970) at the Centre for TV Research.

> A second issue concerns the possibility of improving the quality of broadcast material and audience response. The growth of broadcasting was accompanied by optimistic views concerning its potential for raising cultural standards. It was seen by some as offering a means of breaking down the barriers erected by different education and social backgrounds and of making possible the sharing in a common culture at a reasonably high level. Many of the early optimists would probably regard what has subsequently happened as disappointing,

> despite advances in a number of areas. Yet all these expressions, both of hope and of disappointment, have necessarily been propounded without the guidance of evidence about the motivations that underlie the use of mass media in our society. The research proposed should contribute both to more informed judgements about popular taste and to more realistic assessments of the potential of television to promote a cultural advance.
>
> A fourth matter to which the outcome of the research could be relevant concerns criticism of the mass media and the standards that may be appropriate to this activity. Many critiques of popular television content, e.g., the kind represented in the Pilkington Report, fail to be convincing because they are based on external criteria enunciated by an educated and literary minority who do not see themselves as part of audience. They fail to take account, then, of what may be the complex and deeply felt ties that actually attach many people to popular media fare. An attempt to chart these links in a systematic way should help to strengthen the relevance of this critical activity. We do not refer to critical activity merely as an academic pursuit though it has a place in education. More importantly, criticism of the media, in the sense of applying standards of appraisal, is a prerequisite of considered policy making. Decisions about the control of broadcasting, the balance of content, the provision of more channels and longer hours of transmission, etc., must ultimately stem from judgements compounded of facts and values. Our interest lies in augmenting the flow of evidence into this process.

What is particularly interesting about this research is that although restricted to news programmes and such soap operas as 'Coronation Street', the gratifications—Blumler's word not mine—that viewers got from viewing these programmes were found to be often far removed from simple recreational ones. The research has now been extended to printed material.

I have stressed that essentially our problems should be seen in terms of the communication difficulties that they present, and that there are a number of techniques that could help us evaluate how effective we have been in overcoming these difficulties, none of which as far as I am aware have been used. I cannot but resist making the plea that a greater portion of our research effort should be directed towards answering these questions, *i.e.*, what kind of contribution are libraries making to corporate goals? For too long we have been concerned with the effectiveness of parts of the system and not the whole. I have deliberately been critical of our present methods and as competition for resources intensifies, libraries are going to have to produce more convincing arguments than they have in the past. For example, if it is more cost effective to recruit technological gatekeepers and close the library, let's do it, but let the argument be based on solid evidence and let us ensure that the library case does not go by default.

REFERENCES

1 LEVITT, THEODORE. Marketing myopia. *Harvard Business Review*, July/August 1960, p. 45–56.
2 BRITISH INSTITUTE OF MANAGEMENT. Profit Centre accounting: the absorption of central overhead costs. Management Survey Report No. 21, 1974.
3 ALLEN, T. J. Organisational aspects of information flow. *Aslib Proc.*, 20 (11), November 1968, 433–54.
4 HANSEN, I. B. The value of user studies in the planning/of Library and Documentation Services. EURIM Conference proceedings p. 141–3. Aslib, 1974.
5 HASKINS, J. B. Factual recall as a measure of advertising effectiveness. *Journal of Advertising Research*, March 1964.
6 CLUCAS, J. E. Commercial testing. *Admap*, October 1971.

7 SHOTWELL, THOMAS. Information flow in an industrial research laboratory: a case study. *IEEE Transactions on Engineering Management*, Vol. EM-18 No. 1, February 1971, p. 26–33.

8 EMMETT, B. P. A new role for research in broadcasting. *Public Opinion Quarterly*, 32, 1968, p. 654–5.

9 BLUMLER, J. G., BROWN, J. R. *and* MCQUAIL, D. The social origins of the gratifications associated with television viewing. Report on the first stage of a project supported by the Social Science Research Council, 1970.

DISCUSSION

MR ALAN SINGLETON (Institute of Physics): Attention needs to be paid in 'user' studies to those who do not take part in the activity under consideration. In this respect adaptations of techniques used in mass communication may have difficulty.

MR BLAGDEN: The non-user does present problems, but it would be interesting to establish what information he does use to make decisions and from where he obtains this information. There have been a number of general studies of information flow within organizations and as far as I can recall the library did not figure at all prominently in most of these.

DR D. A. LEWIS (ICI Plastics Division): One means of gaining an idea of the value of a service is to cut it and to measure the uproar that follows, if any!

MR BLAGDEN: There are two ways of using this ultimate measure of effectiveness: one, as Dr Lewis suggests, by closing the library and measuring carefully what happens, including the cost of highly paid staff either making bad decisions on the basis of inadequate information or by spending a great deal of their time obtaining information. The other method would be to compare two organizations of similar size, objectives etc., one with and one without a library. As far as I am aware neither of these methods have been employed, although we did conduct a modest experiment in Access in an attempt to simulate a library-less environment, the results of which will shortly be published.

MR RALPH GEE (Kingston Polytechnic): All market research in communications should pay more attention to the difference between mass media in the instant sense in content and the quality sense over a period of time, such as with a high circulation newspaper.

MR BLAGDEN: Many market research techniques have been applied outside the area of mass media and even when they haven't, I believe they still could be used with advantage in the field of librarianship.

The author's opinions are his own and do not necessarily reflect Council policy.

Communication within the organization: organizational development, team making and informal meetings

C. A. Lumsdon

Cranfield School of Management

Paper presented at an Aslib Symposium on The Communicators, Geological Society of London, 4th March 1975

Introduction

IN THIS PAPER I hope to outline the reasons for the growth of the strategy known as organization development, describe some of the methods it uses and briefly review its current status. It is not intended to be an exploration in great depth—nor is it intended to be a sales pitch for consultancy work. Its intention is that readers shall be able to understand a little of the strategy and optimistically be able to see how they can take some of the methods outlined further in their own organizations. In order that we can get to grips with the subject, I shall only rarely acknowledge references and reduce the amount of jargon.

Organization development

The name 'organization development' suggests several meanings—some explicit, some implicit. This confusion has resulted in OD being used literally to describe a strategy for combining all various approaches to organization improvement in one grand package, and also to describe a technique based in interpersonal or interactive skill improvement. This confusion has been magnified rather than minimized by consultants and technique salesmen who see OD as a useful and somehow meaningful 'catch-all basket' in which to display their wares. So we get OD and management development, OD and training, OD and OR, and eventually one suspects OD and the computer.

In this paper I am going to take as my definition of OD 'the long-range effort to improve an organization's problem solving and renewal processes, particularly through a more effective and collaborative management of organization culture—with special emphasis on the culture of formal work teams—with the assistance of a change agent or catalyst (internal or external) and the use of the theory and technology of applied behavioural science, including action research.'[1]

The definition assumes that the organization and its members have to diagnose and make decisions about the opportunities and challenges of its environment. Does it redefine its purpose and methods to take account of today and the future, or is it trapped in its past? Does it tap the creative potential of all its members, or just the creativity and commitment of a select few?'

Aslib Proceedings, 27 (8), August 1975, p. 327–38. Printed in Great Britain

The problem of the modern organization is to somehow solve todays problems whilst organizing to face tomorrows problems. For the failure to solve either to the exclusion of the other can result in the death of that organization. The vast acceleration of the rate of change creates the greatest threat to the survival of an organism or organization, and organization survival is a primary responsibility of management.

The two main areas of change are in the field of technology, as John Gardner[2] said, 'Our *status quo* has been knocked head over heels by the revolution in science and technology, in transportation, in communication and the processing of information, in industry, agriculture and education, in demography and biomedical affairs. The swift pace of these revolutions makes it desperately necessary that our institutions are adaptable. When they are not, the sweep of events isolates them and dramatizes their anachronistic nature'.

The other major change has been the change in people's expectations, rising from affluence, widespread education and rapid communication. People place a higher value on themselves than they used to and feel that what they want is important and not to be lightly denied. This is forcing a change in the distribution of power—Cardinals challenge the privacy of the Pope, groups of people hitherto docile now stir restlessly, minority groups cry for autonomy over their own affairs. And this process is mirrored within the modern industrial and commercial organization.

One of the reasons is that the very central elements of most organizations creates the basic organizational dilemma. The division of labour, which creates on the one hand work efficiency, results on the other in the ever increasing complexity that such specialization brings to the integration and co-ordination of the total task.

The nature of the problem is not new but it is becoming more complex, the viability of production efficiency versus the increasing problem of identity and survival from a behavioural standpoint.

The problem as Beckhard[3] stated it is 'How can we optionally integrate the technical and human resources and energy that we manage toward achieving the organization's mission, be it profit or learning, and at the same time so manage the working arrangements and the role relationships that people's needs for self worth, growth and satisfaction are significantly met in our organization?'

The situation is simply that our production technology has so far outrun our social technology. The problems of alienation and anomie that exercised the minds of Marx and Durkheim in the 19th/20th century are in no way improved. In fact, it might, I think, successfully be stated that we are currently creating such high levels of alienation that we stunt the individual's social growth and create anomie to the extent that large numbers of all levels in our organizations have adopted the strategy of withdrawal rather than revolution.

Obviously there have been attempts to solve both these problems, but in the main the solutions offered are individual or small scale—job enrichment, job enlargement. These may satisfy some individual needs, but they do not improve the co-ordination relationship between jobs in terms of the total task of the work group, or between work groups to establish an effective organization.

The problems are there—we know they are there—we see them everyday—

distrust and suspicion between groups either horizontally or vertically related in the organization. In such an environment restrictive practices multiply and form strong barriers to change. It is such group defensiveness and exclusiveness that presents major problems of organizational survival. Organizational development sees its function towards the establishment of solidarity, by facilitating, co-ordination and co-operation between the various specialized sections of each organization.

But you may ask 'can't the organization handle this process itself?' I am not convinced that they can. I believe that many organizations are in the middle of the entropic process, a law of nature in which all forms of organization move towards disorganization or death. Complex physical systems move towards simple random distribution of their elements. Biological organisms run down and perish. Organizations must ensure their survival by importing more energy from the environment than it expends. But organizations demonstrably fail to change themselves. We can use the analogy of a psychologically healthy individual as someone who has a strong sense of identity and purpose in life and yet has the capacity to cope readily with change. If we extend the analogy to our organizations we see them exhibiting behaviour which would be characterized as immature or pathological in individuals. Typical of these behavioural qualities are dependency, rebelliousness, and defensiveness—not secure in ourselves nor can we trust others, so we build masks which limit our capacity to learn from others and to know and validate ourselves—narrowness of perspective. We do not see the world as it really is, either inside or outside the organization. We focus on a subtotal situation and inevitably respond in unsuitable and fragmented ways. The stock-in-trade of many management consultants is to show the organization how far removed from reality is its picture of itself.

The kind of characteristics which I perceive that the unhealthy organization possesses are:

1. Little personal investment in the organization objectives except at top levels
2. People lack interest in organizational problems, discuss them with everyone except people involved
3. Status etc. becomes more important than problem solving. People treat each other with excessive politeness that masks real issues
4. People at the top try to control as many decisions as possible. They make decisions based on inadequate information
5. Managers feel alone in trying to get things done.
6. Personal feelings and issues are not accepted
7. People compete when they need to collaborate. They are very jealous of their area of responsibility. Seeking help is seen as a sign of weakness
8. Conflict is mostly covert and managed by office politics and other games, or there are longstanding arguments
9. Learning is difficult
10. Feedback is avoided

Contrast this with what I regard as the characteristics of a healthy organization where:

1. Objectives are widely shared and there is a strong flow of energy towards those objectives
2. People feel free to signal their awareness of difficulties—they are also optimistic that they can be solved
3. Problem solving is pragmatic
4. Decision making is related to functional factors—lack of time, availability of information, workload, development and not organization level
5. Sense of team effort—sharing responsibility
6. Collaboration welcomed. Competition accepted but in direction of a shared goal
7. Conflicts are brought into the open and considered important to decision making and personal growth
8. Feedback of progress is constant. People see themselves and others as capable of significant personal development and growth

What it means for many organizations is accepting the idea of revitalization or self renewal—the elements of this are:

1. Ability to learn from experience and to codify, store and retrieve relevant knowledge
2. An ability to learn how to learn, that is, to develop methods to improve the learning process
3. An ability to acquire and use feedback mechanisms on performance. In short, to be self-analytical
4. An ability to direct one's own destiny

I think I have outlined here not just what I consider as the characteristics of the unhealthy organizations that I have met, but I imagine have identified some of the characteristics of your own organizations. In outlining what I have developed as the characteristics of the healthy organization, I have described not only what I and other OD consultants consider the characteristics necessary for a healthy renewing organization, but also implicate some of the values which OD consultants in general seem to share.

The development of these concepts and values come from many sources. The work of Mayo, Rothlesberger and Dickson[4] provides one of the early beginning points. The now famous 'Hawthorne' effect established that people will work hard if they feel that the objective is worth achieving. People apparently want to be involved in and participate in meaningful activities. Lewin and his students also produced research to show that participation may lead to greater productivity, commitment and personal satisfaction. They went further to show that it also benefits the organization in that people have important, unused contributions to make. Several studies on the facilitation of participation showed that certain leadership styles do help, particularly those that are people centred, and which encourage initiative and independence. Argyris[5] went further and suggested that organizational structure and control mechanisms produced dependence and frustration which would tend to lead towards absenteeism, turnover, emphasis on material rewards, etc. Douglas McGregor[6] summed up the feeling of the movement when he postulated his idea of theory X management, which believed people avoided work at all costs, and sought and preferred direction and avoidance of responsibility. He contrasted this with his idea of theory Y management which assumed that if work is as natural as play, then man will exercise his own direction and self control in the service of the objectives to which he is committed. The average human being under the right circumstances not only accepts but seeks responsibility, and the ability to exercise a high degree of imagination, ingenuity and creativity in the solution of organization problems is widely, not narrowly, distributed in the population.

Examples of research bearing out McGregor's theory have come from many sources in America, Yugoslavia and the UK.

Along with these developments on individual motivation and preference at work, there was the work in group dynamics by Lewin,[7] Bales,[8] etc., which showed how group productivity and morale were influenced by leadership styles, and Sherif[9], who showed how intergroup conflict arises and the consequences of it.

The National Training Laboratory at Bethel in Maine developed the idea of group dynamics training methods, giving a technology of group observation and intervention in group processes which have been developed over the last twenty years.

These have been the major sources for OD values and research; the result has been the acceptance of the following values for many OD consultants.

1. Providing opportunities for people to function as human beings rather than resources in the productive process
2. Providing opportunities for each organization to move towards high collaboration and low competition between interdependent units
3. Create conditions where conflict is brought out and managed rather than being covered up—a large amount of energy is expended in this area
4. Create a climate of trust and openness where communication is less distorted/perception more accurate

To summarize so far, OD has developed as an overall strategy to facilitate change in organizations to help organizations become more healthy, and we have seen what its implicit values are. Just what specific problems of communication does OD hope to help solve?

At the level of the individual there are four main problem areas:

1. The individual's false perception of himself due to lack of feedback
2. His stereotyping or false perception of others
3. His reluctance to learn to improve either of these false perceptions because of lack of overall organizational support
4. His withdrawal from the organization due to lack of consideration or involvement

At the group level the problems are the pressure, etc., to conform to group norms and the failure to appreciate the individual with his deeds in the group context, resulting in role struggles and hidden agendas during group meetings. The group also blacks real communication by failing to hear members of the group due to the group's overall concentration on the accomplishment of the task and failure to consider the process itself.

At the intergroup level, the negative effects of group stereotyping and misperceptions which we have mentioned earlier, and the subsequent concentration on conflict and competition instead of collaboration are too well known and self evident to need reiteration.

At the level of the total organization there is the conflict of specialization versus integration mentioned earlier, the structural problems of organizing for better, more useful communication, the problems of information clogging the system because of the necessity for decisions to be taken too far away from the information source. There is also the problem which must concern many here of the use the organization tries to make of the specialists it employs, including the information specialist.

For if the organization cannot itself get realistic information from whatever technique it likes, and if it fails to get accurate and immediate feedback to enable it to maintain a correct perception of itself, then as we have seen that organization is unhealthy and liable to die.

How does OD go about this seemingly enormous task? For I suspect many of us would perhaps agree with its value system, its goals, and see in the idea of an unhealthy organization many of the elements we have so disliked and found to be so counter productive in the organizations in which we have worked. But because of the seemingly all pervading nature of these problems, we are sceptical. What techniques does OD use? Does it teach 'Ten block-buster formulas of persuasion and how to use them'? (Recent American chapter title.) The central core of the OD effort is the process of planned change first described by Kurt Lewin[10]—the so-called action research model.

The technology of OD consists of a rapidly growing collection of techniques and methods emerging primarily from the behavioural sciences. I shall briefly explain a little about these techniques and how they are used. I shall then go on to illustrate a couple of OD efforts in the UK which I know about and which have used these techniques.

1. Life and career planning

Individuals clarify with the OD specialist acting as a resource their long-term objectives in the light of their strengths and limitations of a personal, professional, managerial or other nature. Life planning involves making plans for development in areas where this is considered necessary, and making short- and long-term plans to facilitate the attainment of long-term objectives. This is used where organizations wish personnel to unfreeze and to perceive opportunities for mobility.

2. Coaching or counselling

Here I must defer to Andrew Smzidla who operates as a counsellor in British Oxygen.

3. T-Group or sensitivity training

Used to improve social sensitivity and interactive skills—not new but not used widely in Britain. I am sure you have heard about it, but not many will have participated: 6–10 people, usually strangers—few days to a week—no agenda—no procedure—no organization—provides a form for a study of here-and-now behaviour and also a safe environment in which members can experiment with new behaviour and learn about their consequences for other members and themselves. It is suggested that it has three main goals:

—increases in sensitivity
—increases in diagnostic ability
—increases in action skill.

How effective?—useful and durable for individuals—the assumption, however, that it will produce benefit for the organization is not proved—job environment differs from T-group environment. Again, it can be very useful as the start of an unfreezing process when people are being encouraged to learn, but not to produce some specified or long lasting work behaviour.

4. Skill Education

Interactive skills. There are many programmes which attempt to work in the development of individual interpersonal skills—these range from Coverdale Training, in which people learn from planned experience—they learn a systematic approach to getting things done via achieving a series of practical tasks. Learning takes place in groups, and members can study and learn from this. It is essentially practical and a reaction to unstructured T-groups. It has many adherents—it leaves a doubt in my mind in that the learning is in one group, and it is possible that the behaviour learned is really applicable in the main to that group and not transferable.

Communication processes/Interactive skills

Certainly one of the most important processes, and easiest to absorb, is how people communicate with each other face to face. It is not just a simple problem of transfer of information from one person to another. It is anything but simple as we transmit facts, feelings, perceptions, innuendoes etc. in the same 'simple' message.
How can we analyse:

1. Frequency and duration
2. Type of contribution
3. To whom
4. Who talks after when
5. Gestural communication (Kinesics)
6. Differences between manifest and latent meanings
7. Complex interaction between two people
8. Filtering due to (i) self image
   (ii) self fulfilling prophesy

Interactive skills

The aim here obviously is to improve the interactive, interpersonal skills of the individual. It is felt and has in fact been researched that the majority of problems that people experience at work are in the area of interactive skills. A survey, for instance, of supervisors in the Chemical industry showed that 30 per cent technical and 70 per cent interactive skills were needed.

The problem is often overlooked, and as someone once said 'sciences are developed in reverse order of their usefulness to mankind—the science of communication will inevitably be the last'. The problem is how to improve skills whilst ruling out problems of grouping accidents—transferability in organizational environment—and the fallacy of 'the one right way'.

It should also to be able to give the participant some idea of where on the map he is starting from and how he is progressing. The best example of a highly efficient and yet sophisticated process I have seen was designed by BOAC and ICL trainers.

Here they worked in groups using their own behaviour analysis. Each person's behaviour was analysed during group activities using the behaviour analysis. After two days the feedback was fed in showing the individual and his performance on a scale and comparing him to the average. The sort of criteria used are bringing in, supporting, building innovations, shutting out, disagreeing, criticizing, and solidifying. The individual can then decide for himself, set measurable aims for his own behaviour and is also asked to produce some proposals for how he might increase the probability of achieving the aims.

The emphasis is on the individual—his behaviour, his proposals. The trainer acts as a counsellor. This seems to be achieving measurably good results in BOAC and ICL.

Teams and groups

Team building usually involves developing the group along dimensions such as the following:

1. Increasing understanding of goals of group
2. Getting agreement regarding goals
3. Increasing commitment to these goals
4. Improving communication in the group by developing skills such as listening and empathizing, and reducing evaluation and conflict
5. Improving problem solving
6. Speeding up and improving decision making
7. Handling conflict in a constructive way
8. Increasing trust levels
9. Helping group develop supportive skills
10. Develop skills to help group utilize resources of each team member
11. Set up mechanism for regular evaluation

Family T-group

Using work related T-groups meeting away from the work place. This is used extensively by Alcan Canada.

—powerful way to affect social systems
—everything is there
—can reach stage where people begin to behave in open and authentic way
—establish reference for working through and managing conflict

—this kind of interpersonal competence is valued by Alcan
—transfer from laboratory to organization is facilitated by family group.

Intergroup confrontation meetings
This is used to reduce intergroup conflict and to increase effectiveness of group interaction.

Process

1. Groups brought together off-site and asked to list attributes of each other—perhaps what others see of them, perceptions shared and help in correcting stereotypes and
2. Contrast seen with how the group wants to be seen—help towards action plan.
3. Help groups with problems—bargain and negotiate about mutually acceptable behaviour—INTEGRATE

Total organization
In this method the whole organization is used as the basis for change, involving:

—changes in appraisal or evaluation methods.
—MBO but as facilitator of improved performance, not as control procedure—not easy
—changes in reward system
—structural change—matrix }
—mission } turbulence
—survey feedback.

Grid training
This can also be called Instrumented laboratory training, and was developed by Blake and Mouton.[11]

This tries to make the feedback process more systematic, objective and relevant to the learning that the method hopes to bring about. This is achieved by use of scales and measures which are completed after each session and plotted on a wall chart. Group and individual, without trainer, discuss and action-plan themselves.

A further development, also by Blake and Mouton, is the Managerial grid which is task orientated and based on the grid itself which attempts to position an individual's managerial style. It then tries to help people shift their behaviour to a more appropriate style following receipt of this knowledge.

These are some of the available techniques and skills which are available to the OD practitioner. What is the relevance of all this to us? If this is questioned I fear that I have not been very successful as a communicator.

First, information specialists are all change agents. By definition their aim is to bring changes to the three sub-systems, technical, occupational, and political which make up the organization—they are certain to disturb internal situations, otherwise they can have no results to justify their existence. It is useful, therefore, for them to understand some of the problems of the change agent in a slightly different area, and it may be that in terms of analysing power, influencing systems and similar, it could be instantly useful.

Secondly, I would think it is essential that information specialists are aware of how to present their information or services in such a way that the integration executive realizes that they understand the effects of the change and are prepared to collaborate with him in planning this aspect, as with the substantive content of the data and advice they provide. The ability to present information in this way and to negotiate contracts like the one outlined earlier can require interpersonal skills of a high order.

Thirdly, in the macro sense, I feel that the communication professionals should be taking the lead for the rest of the organizations they work for in trying to establish some of the values outlined earlier which, if established, stand to benefit communication specialists at least as much as any other.

Fourthly, the information specialist can operate in an integrative role within the organization if this is thought to be useful for the overall organization objectives. Because of his relatively neutral role, it would seem likely that the information specialist could be more active in helping to reduce intergroup conflict by any of the means mentioned earlier.

Fifthly, by utilizing some of the interactive concepts it is possible to envisage ways of improving the kind of skills that specialist service functions need, such as:

1. Building relationships with clients and client systems
2. Diagnosing and developing readiness of clients to receive and use help
3. Understanding the variety of influencing or advisory strategies (influence without formal authority)
4. Building contract with client
5. Understanding impact of change on system
6. Developing action plan with client.

Summary

In this paper I have tried to give some of the flavour of OD, its aims, values, development and the processes and technology it uses in order to create what I consider to be a more healthy and vital organization, more able to cope with increasing change. As we have seen the strategy is heavily value laden, though not many of us would disagree with its hopes for an open, trusting organization with a close finger on reality due to good feedback mechanisms.

Whether the strategy can, in the long term, break down the at times seemingly insurmountable barriers of inertia, tradition, culture and the often ignored social effects of the external environment is difficult to say. Certainly the one organization which has a complete commitment to OD, TRW systems (a 15,000 strong aerospace company in the USA) transformed itself from a one-product company to an aggressive and profitable company covering the whole aerospace market.

The problems for OD are:

1. How to get a stronger sense of identity—or risk being a fashion
2. How to come to terms with external social inertia or pressure
3. How to lose its aura of being a soft 'be nice to people' technique

4. How to get people inside organizations to take up the invidious role of internal change agent.

For the future I think that the name will become less fashionable and its adherents less evangelical, but that its approaches will be adopted by more organizations under other names. I also suspect that much of its aims will be to a large extent achieved when people and organizations realize that they have to learn, accept and cope with change rather than resist with almost pathological fear.

REFERENCES

1 FRENCH, W. L. *and* BELL, C. H. *Organization development: behavioural science interventions for organization development.* Prentice Hall, 1973.

2 GARDNER, J. America in the twenty-third century. *New York Times,* editorial, 27 July 1968.

3 BECKHARD, R. From confusion to cooperation. *Industrial Management Review,* no. 1, 1968.

4 ROTHLESBERGER, F. J. *and* DICKSON, W. J. *Management and the worker.* Harvard University Press, 1956.

5 ARGYRIS, C. *Management and organizational development.* McGraw Hill, 1971.

6 MCGREGOR, D. *The human side of enterprise.* McGraw Hill, 1960.

7 LEWIN, K. Group decision and social change, *in Readings in social psychology.* Holt, 1958.

8 BALES, R. F. *Interaction process analysis.* Addison Wesley, 1951.

9 SHERIF, M. *et al. Intergroup conflict and cooperation: the Robber's Cave experiment.* University Book Exchange, 1961.

10 LEWIN, K. *Field theory in social science.* Harper & Row, 1951.

11 BLAKE, R. *and* MOUTON, J. *Building a dynamic corporation through grid organization development.* Addison Wesley, 1969.

FURTHER READING

CAMPBELL, J. P. *and* DUNNETTE, M. D. Effectiveness of T-group experiences in managerial training and development. *Psychological Bulletin,* 70, 1968.

DISCUSSION

MR JOHN BLAGDEN (Greater London Council): You mentioned that Organization Development is not a soft technique designed simply to improve happiness. However, is there not a great deal of recent evidence which suggests that OD does tend to improve morale, encourage a greater degree of participation and yet has little or no effect on corporate performance?

MR LUMSDON: Certainly there is little hard evidence showing a direct identifiable relationship between organization activities and corporate performance. In the interlocking, overlapping modern organization there are very few areas where one can say this is a direct result of this. I know management training of any kind is usually justified on the 'act of faith' basis—that is, you feel you ought to do it, but you cannot quantify its benefits. Information systems possibly come in the same category. What one can identify, as I have tried to point out, are the areas where unless the organization takes steps to improve or modify these they will result in the death of that organization. This creeping insidious sickness that results in the collapse of the organization; I feel that we can all think of current industrial settings where the organization has manifested the unhealthy characteristics to such an extent that it is incapable of carrying on in a commercial sense.

MRS A. VICKERY (University of London): What is the culture of an organization?

MR LUMSDON: The culture of an organization, in my terms, means the accepted attitudes, values, communication patterns and relationships experienced by the individuals within the organization. We have all experienced the very different cultures or climates in organizations of similar sizes, objectives, technology etc. This effect is difficult to measure, but I feel that when understanding an organization it is important to realize these differences; they determine one's approach to the problem.

MRS VICKERY: What is the difference between internal and external consultants? Who can be an internal consultant?

MR LUMSDON: The problems of the consultant are quite well known and many are common to both the internal and external consultant. Some of these are:

1. The apparent dilettante nature of the consultant's approach
2. Who the consultant is responsible to
3. The inevitable short-term nature of the consultant's assignment
4. The relationship between the expert and the line manager

These problems are magnified for the internal consultant by the strain of trying to implement organization-wide change without having the status to ensure that the real problems are faced.

The external consultant can overcome this problem by his reputation from historic achievement or academic reputation, but his involvement is inevitably finite and invariably his influence has to be of a catalytic nature.

In the end, one has to develop a team of internal consultants who are committed to OD aims and who have the support of top management; only that way can real change be created in the organization. OD would not be true to its own values if it did not ensure that the organization and its inhabitants controlled their *own* changes and developments.

MR ROY STOKES (Construction Industry Training Board): 'Time spent on reconnaissance is never wasted.' Does not this time-honoured military principle apply to the introduction of OD to an organization, or in other words is it not essential to determine by whom it would be likely to be acceptable and when it should be introduced?

Is it not also essential to ensure commitment to the concept at the highest level? It may be accepted by the staff at all levels, but if the Board of Directors are not convinced it will be a failure.

Finally, is it not a fact that OD is more likely to succeed in an organization where MbO is practised than in one without clear objectives? Maybe OD should be introduced in conjunction with MbO?

MR LUMSDON: I would agree with the statement about reconnaissance—in many respects it relates back to my statements earlier about an organization's culture or climate. It must inevitably be supported by top management—any attempt to introduce OD by the back door is doomed, I fear. The timing is also important—though inevitably organizations only act when the abyss opens at their feet.

The major commitment from the board or similar must be to accepting the values of OD outlined earlier. The emphasis on coping with change, with increasing the individual's influence, with removing some of the unhealthy conditions I mentioned. The actual strategies are so many and various as I have attempted to show that there is no need to commit to any particular strategy in advance. The problem is that many Boards and similar august bodies have been frightened by some of the more esoteric strategies described in technicolor terms in the popular press. It is also true that the same bodies often have an inbuilt resistance to change, fearing (often quite correctly) a diminishing of their traditional power. It could, therefore, be said that the people who most need help in coping with change problems are the very people who most resist it!

I would agree that clear objectives would help the introduction of OD—however, I am not sure that MbO is the same thing as the establishing of clear objectives. In my experience all too often MbO has turned out to be used as a measurement tool, or seen as another stick to beat people with, and finally as a giant paper-chasing exercise. It has resulted in one organization I know to have increased the rigidity of that organization and reduced its capability to respond to changing circumstances. Whilst these are not the intentions of MbO I do feel that, like many individual techniques, they are applied as a panacea and not part of a long-range effort to improve an organization's problem solving and renewal processes, as previously I defined OD.

The effect on an organization of communication with the outside world: the relationship between free flow of information and an organization's effectiveness

Andrew Robertson

Polytechnic of Central London

Paper presented at an Aslib Symposium on The Communicators, Geological Society of London, 4th March 1975

WE PAY LIP SERVICE to 'communication', a concept which came to us from the United States and became fashionable among industrial advisers and a few managers in the 1950s—to the extent that some companies appointed managers of communication. This job appears to have had a variety of specifications, but the incumbents might be summed up generally as a combination of information officer with an internal public relations function. The term 'public relations' is no longer of use in describing an organization's relations with the outside world, because PR has assumed overtones suggestive of defensive and selective propaganda, a one-way flow of 'image building' information, rather than the two-way flow recommended by the communication experts (of course, there is an inward flow, but it amounts to little more than monitoring the media to pick up clues as to the effectiveness of the outward flow).

A good communicator is a good listener or receiver as well as a transmitter. This is essential to avoid 'noise' being generated by misunderstanding and to avoid loss of useful signals. It is noteworthy that this offshoot of behavioural science grew up alongside the development of radio, television and other electronic devices like computers, and adopted some of the new terminology of the new applied science. Some writers even refer to good communicators in the organization as 'transceivers', accurate conveyors of useful messages. There is also wide usage of the term 'feedback'.

Communication is seen, therefore, to be a good 'modern' thing. The concept contains the implicit advantages of up-to-date knowledge which is both accurate and intelligible, and which also confers the benefit that the recipient becomes 'well informed'. This applies to all kinds of information flowing into and circulating through the organization: economic and commercial data, both domestic and foreign, political intelligence, scientific and technical information.

Here we shall concentrate on the last type of information and its use by industrial companies. It probably goes without saying that industrial companies

Aslib Proceedings, 27 (8), August 1975, p. 339–45. Printed in Great Britain

cannot hope to survive and grow in a competitive environment without information about their competitors, their industry, their markets, economic policies beyond their control in those markets, in short any commercial intelligence likely to have an effect on their business operations. This is not universally true of scientific and technical information (STI) as Table 1, adapted from Professor Freeman's *Economics of Industrial Innovation*,[1] illustrates.

STRATEGY	*Scientific and technical information (STI)*
Offensive	4
Defensive	5
Imitative	5
Dependent	3
Traditional	1
Opportunist	5

Note: STI rated on a five-point scale

TABLE 1: *Strategies of the firm related to intensity of STI usage*

Three of the six strategies rely heavily on STI, one quite heavily and one very little. It is a subjective rating, and we may consider that the offensive strategy may sometimes require as great an effort in the acquisition of STI as the defensive, the imitative or the opportunist. These three score highly for STI because of their obvious need to know the 'state of the art', the first in order to keep up with the market leaders, the second in order to be able to pursue his policy of leap-frogging most of the development work by making use of the know-how embodied in the products and patents and other publications of the originators, and the third in his search for an opportunity.

At first sight it looks as if the most progressive firms, those adopting the offensive strategy and striving for market leadership through research and development, put less effort into their STI system than those who follow their lead. The full table, however, shows that they put twice as much effort into fundamental research than the defensive firms and nearly twice as much into applied research. In other words, STI is generated in-house.

Compare this finding with the conclusion of Professor T. J. Allen,[2] that research teams showing better performance than others used internal sources of information more, while the poorer performers used outside sources which they tended to overrate. This result is now as much a part of the received wisdom as the famous list of characteristics of the 'technically progressive firm' selected by Carter and Williams.[3] There were twenty-four characteristics and six of them were concerned with information: high-quality incoming data, knowledge of potential users, willingness to share know-how, and to license and enter joint ventures, a readiness to look outside for ideas and effective internal communication and co-ordination. This presents a picture of a company confident in its capability to the extent that it is not secretive. It not only hooks into the network of STI in its environment, it contributes to it.* It is a true communicator.

---

* Some recent evidence of this need to contribute and not merely collect information appears in reference 12 below.

At least this was the kind of organization which seemed progressive to Carter and Williams twenty years ago.

The realistic caveat which managers would now put on this open policy is that of security, in the sense of commercial security rather than traditional secrecy, which seemed at one time to be characteristic of certain types of industry, notably the old inorganic chemical companies, to the extent that there used to be talk of the 'Solvay mentality', after the Belgian company which developed and licensed the Solvay process, the ammonia–soda process, which 'utterly changed the nature and structure of the heavy chemical industry in Great Britain' and led to the formation of a tightly organized international cartel of chemical companies.[4]

One might see this scrap of history as illustrating two aspects of STI. On the one hand the readiness of Mond and Brunner to found a company on a foreign process taken under license. On the other the cloak of secrecy under which the Solvay licensees worked thereafter, which is said to have limited their technological horizons. There is a revealing sentence worth quotation in this regard. Dr B. G. Achilladelis,[5] wrote of the Brunner Mond combine in its later years, 'The company was very successful financially but very limited technologically.' Indeed, they were being overtaken by the Haber–Bosch ammonia synthesis. Achilladelis says that they managed, just before the formation of ICI in 1927, to produce a synthesis process with the help of British government finance. Reader points out that, while the IG Farben group who held the patents for Haber–Bosch and the American firm General Chemical both had a workable ammonia synthesis process, neither Solvay nor Brunner Mond had. Du Pont, another traditional inorganic chemical company, was in the same plight.

What seems to have happened is that the Solvay process conferred an initial monopoly position on its owners and their licensees, enabling them to make monopoly profits (Brunner Mond pursued a policy of buying out any firms who attempted to compete using the Solvay process). Thus they pursued a narrow path to riches but only because of monopoly and cartelization. In a truly competitive environment they would speedily have had to broaden their knowledge and find superior processes. As it was it took new technology, admittedly developed within their competitors' research laboratories, to shake them. Reader says that Solvay 'were certainly alarmed' and 'no doubt Du Pont were also'.

We must balance these clues with a reference to Willard Mueller's[6] finding that over half Du Pont's major innovations came from outside. He showed that out of eighteen innovations the company had originated five and shared in the origin of one. The rest were 'not in-house', which by the way indicated that the so-called Solvay syndrome was not too strong at Du Pont, perhaps because of anti-trust legislation and enhanced competition during the first half of this century in the United States. However, of the seven most important innovations in terms of revenue earning, and including nylon, five came from within. Many writers on innovation in American industry have confirmed the belief that great size, brought about by acquisition and monopolist expansion, is not compatible with technical progressiveness (the argument is given in the sixth chapter of Freeman's book as well as in the full report on Project SAPPHO to the Science Research Council[7]).

It may be that the bigger a company becomes and the more departmentalized as a consequence, the more that top management resists the expenditure of funds on outside know-how. There is a large research facility and a large library and information service—use them, might be the unspoken policy statement. This is not to say that large firms do not innovate, they do, because on the international scene and in conditions of oligopoly they face well-financed competition. But the need to know about that competition and what *it* knows is acute, hence industrial espionage or whatever one may call a well-informed intelligence service. It is not for nothing that offensive innovating companies employ research scientists whose main task is to circulate at conferences and conventions, meeting and talking with their opposite numbers. Such activities may seem to be on the margins of business ethics, but in reality they are no more than attempts to fill the gaps in incoming knowledge gained in more orthodox ways. In a fast changing technological environment up-to-date information is the breath of life to the offensive innovating company.

One must recall in this context that books are out of date by the time they are written, articles are out of date by the time they are published and research reports are not published until they *are* out of date. Word of mouth, provided that it is dependable, and it is a big 'if', is perhaps the least obsolescent medium, hence the value of 'invisible colleges' and other STI networks to reinforce patent inspection, desk research and journal scanning. If secrecy can lead to a corporate closed mind because it shuts off most chances of know-how exchange, so can a routine information system which is no more than that.

Vannevar Bush,[8] a vastly experienced applied scientist with long memories of industrial R & D, wrote as recently as 1971 that 'The inventor who works alone, who is isolated from the current trend of thought, and who hence does not grasp where the real opportunities lie, seldom makes a worthwhile invention . . . especially in these days when things move fast in every field'. His paper was restricted to the individual inventor and his outlook, but may not the same comments be made of the too introspective firm?

There is another aspect of STI as it effects the growth and survival of companies who base their operations on science and technology. In innovation studies we have become accustomed to refer to 'invasion innovations', usually new materials entering old industries and replacing traditional materials—man-made fibres in the textile industry, for example. Some rayon companies collapsed in the face of competition from nylon because they were not well informed enough to 'take it on board' early enough. Others, more accustomed to survival through flexible and adaptable technology, like Courtauld's, not only survived but took over the non-progressive rayon spinners, like British Celanese, who had already swallowed smaller firms like North British Rayon.

Allied to this aspect is the diffusion of innovations. Nabseth and Ray[9] in their study of ten innovations in six countries make it abundantly clear that information about innovations is essential in the diffusion process, and success depends not only on the firm's awareness but also the management's alertness. The really alert firm is among the first, the early adopters, to try out new techniques, and the quality (fullness and reliability) of the relevant information will be a critical factor in convincing and deciding upon the investment, especially if it is large and/or displaces existing hardware after a short interval, or may lead to 'labour saving' on an embarrassing scale.

In an earlier paper[10] the author made reference to the paucity of examples in the literature on innovation of companies gaining a lead or making constructive use of information sources in the course of the innovation process. Everybody knows about Whinfield's discovery of Terylene through the publications of Carothers, only a few specialists will have come across the Foss electric milk analyser based on a principle outlined in the *Journal of Dairy Science* but unknown to this Danish company until they consulted TNO Copenhagen, an information consultancy. Elsewhere I have mentioned the case of the atomic absorption spectrometer invented by Dr Alan Walsh in Australia, reported by him in *Spectrochimica Acta*, but not taken up with much success by an innovative firm until Walter Slavin of Perkin–Elmer crusaded for the analytical principle through a new publication, launched by the firm to inform potential users. The *Atomic Absorption Newsletter*, once a duplicated giveaway, is now a scientific journal of repute sold on subscription.[11]

The latter example is particularly interesting because in the AAS Newsletter Slavin drew together all the relevant published papers on the technique as evidence of its feasibility and value to chemical companies and others—a positive use of an information medium. I would be surprised if there were not a number of other examples of progressive, thrusting science-based companies doing likewise, and perhaps even more of such companies gaining a competitive advantage from the skilful capture of relevant know-how from the literature.

We come back to the theory that Carter and Williams not only propounded but supported with evidence—that the open-minded enterprise, the two-way communicating business, will be up in the forefront not only of technological progress but in the market. It is all the more depressing, therefore, that the competitive pay-off from information services, of relevant external communication, does not seem apparent to so many firms engaged in technological innovation.

What has struck me in making the most cursory inquiry into the communication of STI in innovating and non-innovating firms is how little we know about the connection between performance and information inputs. We know of instances where a firm failed with an innovation because it lacked key know-how which was obtainable by making a visit to a university where parallel work was going on—but the company did not know that it was. Another failed because it was overtaken by a new chemical process from a competitor but was unaware of the danger (although others were and had opted to wait). A third succeeded because it was lucky enough to find the clue to a new process in the existing literature.

On this score let me quote the actual experience of a science based company, African Explosives and Chemical Industries, Johannesburg. They run a simple but ingenious internal system known as TIRSS (Technical Information Retrieval and Storage System) based on a thesaurus of key words and a card index of references. At least this ensures that if an experiment is repeated within the company it is not by accident! Also they look upon a sound data base as essential to innovative work up to but not including the 'breakthrough' level, because if it is a real breakthrough the innovator is unlikely to find help in the published literature. In reality it is rare to be unique even in frontier-of-knowledge technology. But without a good corporate sensing mechanism, how would a company know? A scientist at AE & CI commented: 'Information systems can eliminate research because the answers are already known; they can speed research by providing quicker access to pertinent information; but they can rarely replace the laboratory or the market place.'

One of his colleagues added that TIRSS had saved him much time and waste of effort because it gave ready access to company STI, including overseas laboratories—and they are affiliated to ICI. Of a particular process solution he said, 'A lot of work had been done on the subject, both in our firm and overseas, but nobody concerned would have been aware of this without TIRSS.'

Are we asking the right questions about STI in companies? Ought we not to ask such sharp ones as how many IO's do you have for how many scientific and technical research workers? Ought there not to be an optimum proportion? Can researchers be taught to hunt up information effectively, to read more quickly and better, to make more constructive use of existing services, to be trained as has been suggested to become skilled information scientists. Do staff in companies adopt too passive an attitude to STI and other information services, waiting for the journals to circulate, waiting for the abstracts to be sent to them, and then not reading them? Should key journals and abstracts be kept on a rack near the canteen (or would that block creative conversation)? Not all these questions are frivolous, but it is amazing how many different answers they tend to generate.

REFERENCES

1 FREEMAN, C. *The economics of industrial innovation.* Penguin Books, 1975.

2 ALLEN, T. J. *Sources of Ideas and their effectiveness in parallel* R *&* D *projects.* Sloan School of Management, MIT, Working Paper 130/65.

3 CARTER, C. F. *and* WILLIAMS, B. R. *Industry and technical Progress.* OUP, 1957.

4 READER, W. J. *Imperial Chemical Industries: a history.* OUP, 1970.

5 ACHILLADELIS, B. G. *Process innovation in the chemical industry.* Ph.D. thesis, University of Sussex (unpub.), 1973.

6 MUELLER, W. The origins of the basic inventions underlying Du Pont's major product and process innovations, *in* NELSON, R. R. *ed. The rate and direction of inventive activity.* Princeton U.P., 1962.

7 ROBERTSON A. *et al. Project SAPPHO: a study of success and failure in innovation.* Report to the Science Research Council, University of Sussex, 1971.

8 BUSH, V. Of inventions and inventors. *Research Management,* 14 (4), July 1971.

9 NABSETH, L. *and* RAY, G. F., *The diffusion of new industrial processes.* CUP, 1974.

10 ROBERTSON, A. Information flow and industrial innovation, *Aslib Proc.,* 25 (4), April 1973.

11 ROBERTSON, A. *Innovation management.* Management Decision Monograph, Bradford Management Centre, 1975.

12 PETERS, E. B. International scientific and technical meetings: why go? who profits? R *&* D *Management,* 5 (2), 1975.

DISCUSSION

DR D. A. LEWIS (ICI Plastics Division): With reference to the table showing different types of companies and their scores, within large organizations it is possible to get differing degrees of innovativeness in different departments.

MR ROBERTSON: Possibly, but the success of an innovation depends on corporate behaviour, not departmental. The better the 'coupling' across the firm the greater the chance of success.

MR CEDRIC LUMSDON (Cranfield School of Management): Have you found any links between organizational design and the ability to innovate?

MR ROBERTSON: The presumption seems to be that adaptable, 'organic' organizations will make a better job of innovation than comparatively rigid, hierarchical organizations, but there was little to support this hypothesis in the SAPPHO findings. Even the 'new ventures' system of adaptation is open to question at present.

MR R. SELWOOD (Computer Analysts & Programmers Ltd): Your examples were limited to the chemical industry; was your study limited to this?

MR ROBERTSON: No, in the SAPPHO Project we looked at chemical and scientific instrument manufacturers. Passing reference was made to one of the latter cases (see reference 11). The chemical industry is of particular interest in this connection because of its tradition of secrecy, at least among the old inorganic chemical manufacturers. Petroleum and petro-chemical technology seems to have become more open.

MR J. CAMERON (Balfour Beatty): Do you know of any examples in the UK of the practical use of Synectics in management development or product development? (Synectics—group of multidisciplinary persons of various levels and experience brought together with a key sensitive leader to consider problems. Similar to 'brainstorming'.)

MR ROBERTSON: The only example I know is that of Ferodo. Dr R. C. Parker, their former research director, describes the method in *Engineering*, February 1975, p. 126–30.

MRS P. A. THOMAS (Aslib): In using observation as a method, there are problems on both sides. Are librarians willing to host observers? Is non-intervention possible, or desirable, in that Organization Development techniques encourage positive intervention?

MR ROBERTSON: We favour a non-participant observation technique ('bird watching') so as to influence the actual activity as little as possible, preferably not at all. However, in some situations informal comment on the activity has caused changes and converted the research into action research. Perhaps it is advisable to avoid all comment during the observation. As to willingness to allow access, one can only hope for tolerance.

MR ALAN SINGLETON (Institute of Physics): Your examples of information use in the process of innovation were of people knowing of or reading the literature, *i.e.* documentation. What do you think are the relative roles of documentary and non-documentary information in innovation?

MR ROBERTSON: There are examples where specific publications played a critical part in the innovation (or were reported to have done so, *e.g.* Winfrith's use of Carothers' published papers in discovering how to make Terylene), but they are few. We would like to hear of more such examples, but with full surrounding details to give some sense of proportion.

MR SINGLETON: Do you then agree that, in this case, the literature was not on its own sufficient, but really acted as an access to those who had performed the work?

MR ROBERTSON agreed.

MR M. W. HILL (British Library Science Reference Library): We all know instances of people becoming overloaded with 'information', usually in the form of journals piling up on the desk, and cases of academic research workers who ask not to be fed information lest it so biasses their minds that they cannot produce original ideas. Might it not be profitable not only to study how to communicate more useful information to people but also to study how to control the process and to be able to determine when to reduce the supply? Communication may be made more effective if there is a controlled supply, or contrast between periods of high input and no input, and an understanding of how to attune the supply rate to the need of the individual for input for storage, input to solve immediate problems and no input while he processes into profitable concepts that which he already has.

MR ROBERTSON: The most difficult aspect of STI is to know which inputs will be useful and which not. But what is 'useful'?

Information communication and management

Sir Montague Finniston

British Steel Corporation

Paper presented as the 8th Aslib Annual Lecture, The Royal Institution, 12th June 1975

Introduction

It is very kind of you to have invited me to give the 8th Aslib Annual Lecture—although it is a wonderment to me on what grounds such a choice was made. I hope this audience does not expect me to inform them of the inner story of a recent public debate—or if you do, that you will not be disappointed in the alternative topic I have chosen for this address.

Before I decided on the content of my lecture I studied the previous contributions in this series; this was much less arduous than you may imagine since two out of the seven were not published and I had only their titles to absorb. This survey had several purposes; it avoided repetition of a subject already exhausted (a failing from which information and communication tend to suffer), and it determined the standards which had been set and should be maintained. Features of previous lectures have been that they were delivered by people drawn from many diverse fields of professional activity and career structure—academic, industrial, civil service, science and others which cannot be so simply or misleadingly categorized; that they covered a variety of topics ranging from the world's weather to contemporary society on all of which information is wanted and expected; and that titles without a published text can be ambiguous. The immediate past Lecturer, Mr Basil de Ferranti, spoke in 1973 on 'Looking things up—common sense versus electronics'. Unfortunately his text not being available, I was unable to find out whether common sense and electronics came out on different sides or not. I trust not!

I hope to fulfil the undefined specification of an Aslib lecture by talking about information and communication in the steel industry and to assure you that the title of my lecture accurately represents what I am going to talk about.

Types of information

What is to be understood by information? To many this might be constrained to the published word and access to it; to the more enlightened it would include the spoken word even if held mute on tape. The medium is all. In industry, including the steel industry, information ranges from articles in technical publications to verbal reports of informal meetings and from an inconspicuous news item in a daily or trade newspaper to a patent specification for some ap-

Aslib Proceedings, 27 (8), August 1975, p. 346–61. Printed in Great Britain

parently non-steel industry development. This information has or can have a *direct* bearing on the efficiency of our business and is gained from all kinds of published and non-published sources, collated, classified and disseminated usually to individuals or to defined classes of individuals.

But information is not confined to technical matter of direct concern; information is also news of promotions and movement of staff, conditions of working policies (internal and political) and all matters which may affect or influence individuals in the conduct of their business. This category of information, chiefly news, needs to be disseminated widely to all employees to achieve two complementary purposes, that employees on the shop floor know what senior management is doing and that senior management know what shop floor feeling is. Where industry's employees are well informed this has an indirect bearing on greater efficiency.

Both categories of information can find a wider interested public outside the industry.

Information explosion

Many of the people who rely on information as a management tool have little idea of the enormity of the task facing the information specialists today. One can only sympathize with librarians, abstractors and information specialists, who have to clean up during the continuing information explosion, especially in the scientific and technical literature. The difficulties of dealing with information in the second half of the 20th century is no new task as Lord Rayleigh pointed out in the 19th century.

> In science, by a fiction as remarkable as any to be found in law, what has once been published, even though it be in the Russian language, is spoken of as known, and it is too often forgotten that the re-discovery in the library may be a more difficult and uncertain process than the first discovery in the laboratory.

Scientific and technical journals have come a long way since the first—*Philosophical Transactions of The Royal Society* and the *Journal des Sçavans*—which were published in London and Paris respectively, in 1665. (As providers of information, however, both these journals were preceded by meetings of The Royal Society. People learn to speak before they learn to write.) Recently it was estimated that the scientific and technical literature as a whole is doubling every ten years or so. Some fields are, of course, expanding at a faster rate than this, others more slowly. There are about 36,000 scientific and technical journals extant at present; about 2,500 of these are published in the UK. In practical terms the rate of expansion of the literature means that there are about twice the number of journals published per year now as there were in 1965. Fortunately for the information specialist in the steel industry, the most rapid growth has been in areas other than iron and steel-making, but there is still an ever increasing amount of published material on steel to deal with daily.

But how fast is information growing? Is the scientist, technologist, manager, economist of the 1970s more productive than his counterpart, say of the 1930s? A paper by Arthur Herschman[1] of the Information Division of the American Institute of Physics throws some light on this.

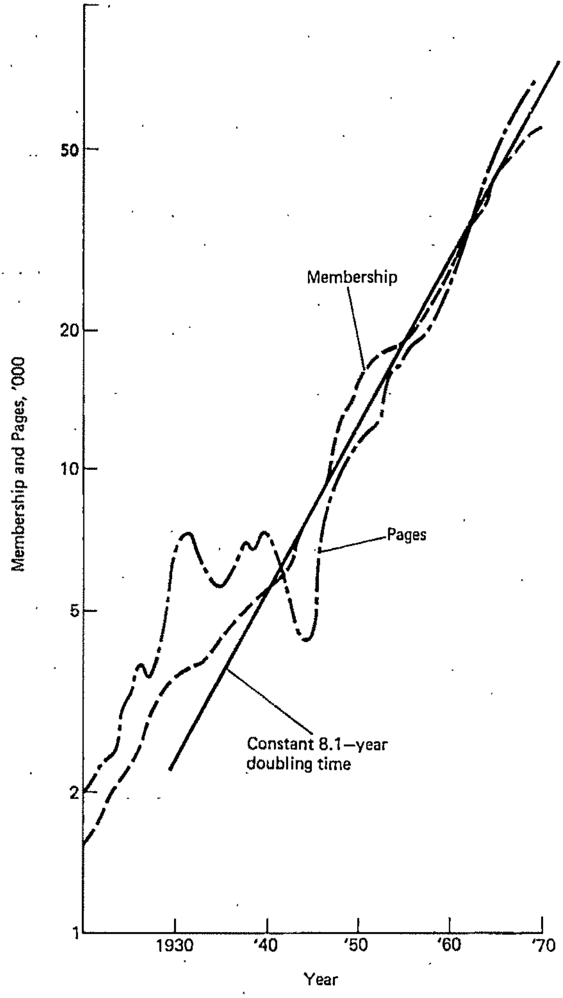


FIGURE 1: *The membership in the American Institute of Physics Societies shows the same rate of increase as the pages published in AIP and member-society journals*[1]

Figure 1 shows both the total membership of the American Institute of Physics Societies and the number of pages published every year in AIP journals from 1920 to the 1970s; also shown is a line with a doubling time of 8.1 years. This demonstrates that, since the 1930s, each member of these Societies has published on average a page per year in the Society's journals, so that the physicist of today (taken as a class, not individually) is no more productive than his counterpart of the 1930s. What is different is that there are now many more practising scientists and technologists than there were in the 1930s—as there are many more professionals of all descriptions—lawyers, accountants and football players. The growth in professional population is matched by the growth of their output—though not necessarily by growth in quality or higher productivity.

These facts are cold comfort to information specialists who have still to sift twenty-five times more published material than their counterparts had to in the 1930s. With such a task it is imperative to decide on a person's or a group's needs before the difficult task of extracting information and putting it into a relevant form is undertaken, since ignorance is less damaging than confusion.

The information needs of people working in the steel industry vary with a person's job. I will consider three broad categories to illustrate this. The first is the research individual, the second the person involved in development and the third the works manager.

Individual information needs

Research

The research man needs to be kept aware of what is going on, principally in his own but also in related fields. This is obtained from the published literature, including scientific and technical periodicals, technical reports from competing companies, translations and patent specifications as well as from seminars and specialist conferences.

The second desideratum is the related, including general, fields of science and technology. Here the breadth of this interest is largely up to the man himself but most scientists and technologists have a more than adequate knowledge of many other fields particularly now that inter-disciplinary activities are assuming greater importance and have a greater bearing in development. Such broad current awareness is obtained from journals which cover a wide spectrum as well as digests, colloquia, conferences, conversations and the media, TV, radio and the press.

The third is the facility to obtain retrospective information on any chosen subject. To obtain this there must be a bank of information with a well-defined method of access. This bank can be partly met from the industrial firms' own library etc., but much more valuable are the other and more numerous banks of other bodies, public or private. The success of such banks depends greatly on the efficiency of information collection for the first two needs which I have mentioned.

While the research man in university relies mostly on information obtained from scientific and technical publications supplemented by his own personal grapevine, the man in industry must cast his net more widely. The industrial scientist must scour—or have scoured for him—as many avenues of information as possible in the hope that something will emerge which will cut corners in his research to yield an early successful conclusion.

Here, I would like to comment on the unformalized value of conversations between scientists in industry or elsewhere. Such information conversations (a form of gossip mongering called the grapevine) are uncritical (the loose expression in speech would never be accepted on paper), liable to misinterpretation and misrepresentation, repetition and uncodified—all the worst characteristics of a good information service—and yet how many good ideas and innovations have stemmed consciously or subconsciously from such a service. How often has it been said that the value of a conference is not the programme itself but the people one meets! So even if it cannot be classified except as miscellaneous, do not eschew it.

It may be thought that it is the academic who is the most productive in publications. In a recent paper, Dr J. Langrish[2] of the Manchester Business School writing in *Nature* on 'The changing relationships between Science and Technology' analysed sources of abstracts in the now defunct *Journal of Society of Chemical Industry*. This journal carried abstracts of the world's literature which were of relevance to industrial chemists. Table 1 shows how the sources of these abstracts varied from 1884 to 1952. The number of university abstracts decreased from 62 per cent in 1884 to 5.5 per cent in 1952. Thus the industrial scientist is not waiting to pick up any crumbs which may fall from the university table but is making his own independent way. Of course, quality of publication and not quantity is what counts. In this regard Langrish does suggest that university developments which have industrial significance tend to be major ones which revolutionize previous practices. There could be arguments on this score but nevertheless it is important for industrial scientists to keep on reading the published papers of academics, not only for their conclusions but for their theoretical background and the new experimental techniques which influence technological development.

YEAR OF JOURNAL SOURCE	1884 %	1889 %	1917 %	1935 %	1952 %
Industry	32.3	67.8	73.8	72.0	87.4
Government	5.9	4.8	5.5	6.3	7.2
University	61.8	27.4	20.7	21.7	5.5

TABLE 1: *Change with time of institutional sources of abstracts in Journal of Society of Chemical Industry for Industrial areas connected with organic chemistry*

Development

The information needs of a research man in industry are not dissimilar to those of an academic, but the needs of a man who is involved in development (innovation) are unique to industry. He is not so much concerned with what is happening at the frontiers of knowledge but what is vitally important to this man is whether there will be a market for his product, whether it is going to be economic and whether he is going to be able to instal plant on time to gain the market advantage. Also concerned with development are the design, building, running and maintaining of plant.

Terotechnology (as this package is called) is a multidisciplinary subject which is emerging in its own right as essential to the efficient prosecution of manufacturing industry. It is a combination of engineering, management, financial and other practices applied to physical assets in pursuit of economic life cycle costs. Terotechnology is therefore concerned with the specification, design, provision, installation, commissioning, maintenance, modification and replacement of plant, machinery equipment, buildings and structure and with feedback of *information* on performance design and costs.

For the effective application of terotechnology, first-class information systems must be created to provide a feedback and interchange of information for the benefit of everyone from the designers through to the maintenance people. Unless the information system is an integral and efficient part of the business, it is impossible to make those decisions vital for day-to-day management and for the longer term capital investment programmes which will place us in competitive situations.

The British Steel Corporation has therefore found it necessary to preserve and log comprehensively the field of performance data as well as design and cost information from within the Corporation. This has to be compared with similar information from elsewhere—or how else can we know whether or not we are competitive? A great deal of data is generated but there is a constant battle to avoid collecting data which, at best, can only be filed and at worst is suspect; as example, primary recording done on the shop floor may or may not be reliable. And besides such engineering information, budgeting and planning for other resources such as raw materials, transport, future engineering workforce and staff resources and the supporting recruitment and training needs etc., have to be catered for.

As an example, take the information system on engineering plant. Works are broken down into cost centres and these then subdivided to form a plant register which identifies by code and description major items of plant or equipment within the cost centre. The plant register is then detailed further to give plant items which are assemblies of parts, and these plant items further subdivided into parts identified by part numbers. This forms the basis of the fixed asset register which includes the original cost of the plant, its current value and replacement cost. The plant register is used for the allocation of maintenance costs and with the fixed asset register it forms the basis of the engineering costs recording system. Extensions of the basic code are used for maintenance planning and control and also spares control and serve to relate the job, the spares and the drawing back to basic cost centre and plant register.

The engineering and maintenance data collected and stored against this coding system is collectively known as the plant ledger and the responsibility of collecting and updating it rests with the plant ledger department. The functions and interactions of this department are shown in Figure 2. It is intended that all BSC works should have plant ledgers based on the common code and these ledgers should be computer based. A computer system is being developed which will provide immediate access and enable maximum use to be made of all the recorded data both locally and centrally for planning control and analysis purposes. This will include not only costs but also plant histories and other descriptive data which will facilitate investigations of maintenance cost, identification of troublesome or high cost items, development and modifications, monitoring of performance, comparisons of maintenance and repair costs between plants, and so on. On a Corporation basis it will enable reviews to be

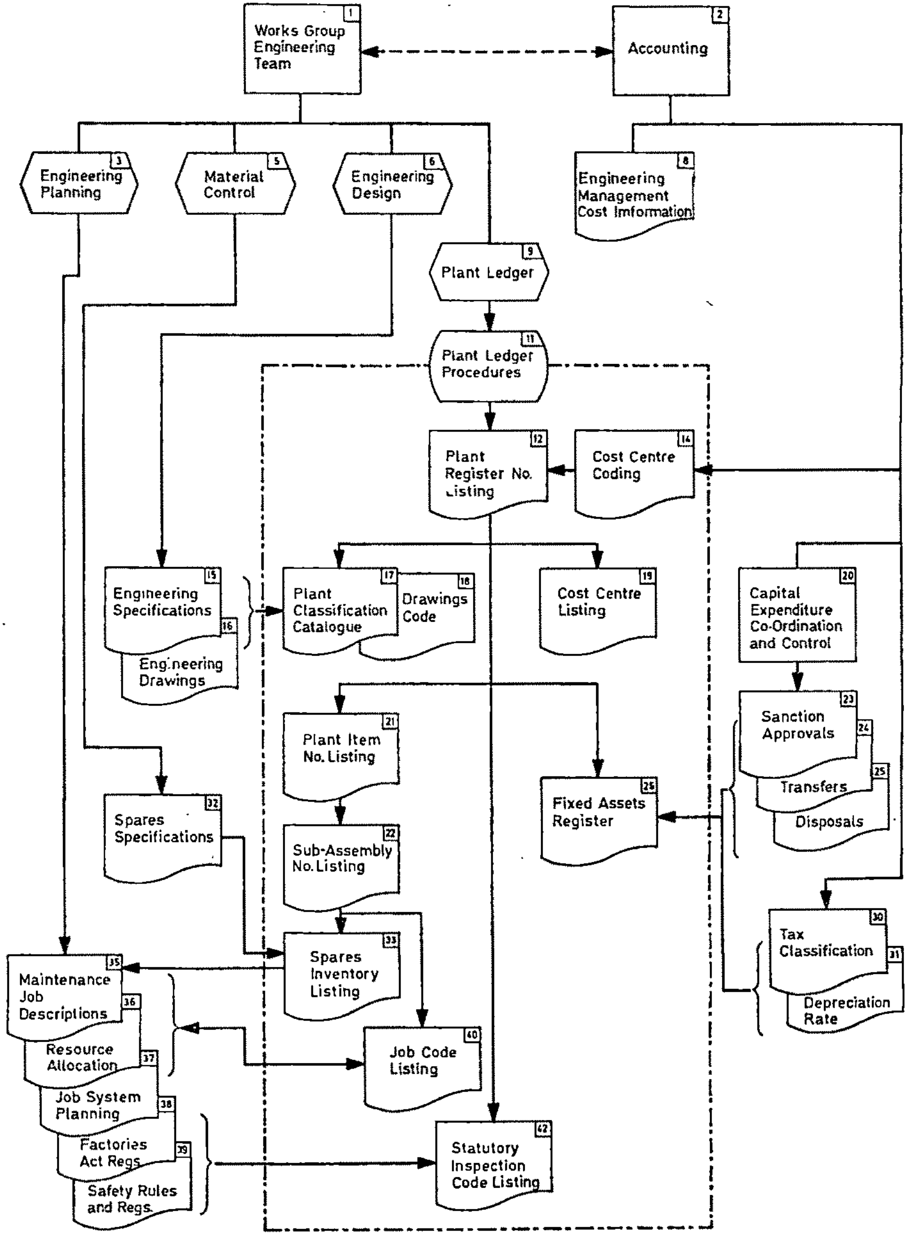

1 Works Group Engineering Team
2 Accounting
3 Engineering Planning
5 Material Control
6 Engineering Design
8 Engineering Management Cost Imformation
9 Plant Ledger
11 Plant Ledger Procedures
12 Plant Register No. Listing
14 Cost Centre Coding
15 Engineering Specifications
16 Engineering Drawings
17 Plant Classification Catalogue
18 Drawings Code
19 Cost Centre Listing
20 Capital Expenditure Co-Ordination and Control
21 Plant Item No. Listing
22 Sub-Assembly No. Listing
23 Sanction Approvals
24 Transfers
25 Disposals
26 Fixed Assets Register
30 Tax Classification
31 Depreciation Rate
32 Spares Specifications
33 Spares Inventory Listing
35 Maintenance Job Descriptions
36 Resource Allocation
37 Job System Planning
38 Factories Act Regs
39 Safety Rules and Regs.
40 Job Code Listing
42 Statutory Inspection Code Listing

FIGURE 2: *The functions and interactions of the plant ledger department within the British Steel Corporation*

made of engineering performance on a works, Works Group, Division or Corporation basis and the Corporation, for the first time, will be able to analyse its total engineering expenditure in some systematized manner based on facts and not the subjective preferences of individuals.

Works management

The Works Manager's primary need is for information to ensure that he meets his Annual Operating Plan and the requirement to meet performance in all aspects of this plan. For example, he is interested in the security of his supplies. Will the iron ore be delivered in time and will it be of the right quality? To what extent will changes in supplies and qualities of raw materials affect the profitability of operations? What will be the sulphur content of coal obtained from a certain coalfield? He is interested on what is happening to his plant—breakdowns, waiting time, industrial relations difficulties. There is an endless array of such questions, and while a great deal of the information is readily available some of it needs experts to search and unearth the relevant data. He is also interested in performance information from other parts of the world on similar plant to that which he runs.

	A	*B*	*Full year saving (£)*
TIME			
Waiting time (h/wk)	30.0	25.0	466,000
Planned maintenance (h/wk)	6.0	4.0	128,000
MATERIALS			
Hot metal (t/t)	0.839	0.834	240,000
Scrap (t/t)	0.181	0.175	137,000
Speed of working (t/hr)	168.5	177.7	154,000
Yield of liquid steel (%)	90.8	91.8	1,312,000

TABLE 2: *Typical basic standards for BOS steelmaking*

Table 2 shows two sets of typical basic standards for basic oxygen steelmaking which can be used to guide the Works Manager in his decisions on where to put effort and the benefits to be gained. The Works Manager has a set of such figures, covering much more than shown in this table which specifies the standards he is to achieve during the year, but he also is informed on what improvements (and failures) mean in cash terms. The last column on the right shows the effect on profitability of changing from the standards A to the improved standards B. It can be seen how tight the tolerances are. Less than half a percent change in hot metal usage results in a change in costs of £240,000 while a one per cent increase in yield results in an increased income of over £1.3 m. Up to date and relevant information is therefore vital to the Works Manager to enable him to meet his standards or better them, for a failure to meet standards results directly in a loss of money; and betterment has its value.

Communication of information

While the gathering and filtering of information is of great importance, it is of little value without effective communication. It is important to note that in spite of the revolution which has taken place in the communication of information in recent years, communication still depends on sight and hearing alone or in concert. There are no signs that any of our other senses will play any industrial communication role. For example, feel through Braille will not become a universal method of communication, nor is it likely that Aldous Huxley's vision of 'Feeling Pictures' as a universal replacement for the cinema revealed in his *'Brave New World'* will come true in our lifetime. Improved methods of communication, therefore, rely on making more efficient and more effective use of sight and sound.

In the past within the Corporation we have used a variety of news sheets, personalized listings and so on, for communicating information to individuals or grades of individuals while the sifting and classification has been done partly by computers and partly manually. The computer has changed the outlook on information in two regards; the speed with which electrons work and the vast storage facilities afforded. The business of extracting, storing and communicating such information within the Corporation will undergo a radical change when the Corporation's new Computer Strategy is developed.

This strategy will be implemented over the next seven years or so and it is aimed at meeting two important requirements: first, to support the Corporation's major capital development plans by increasing the investment in on-line computer production planning and control systems in ten of our larger sites; second, to provide a flexible and robust data processing service to all functions within the Corporation to meet the great majority of information demands, and to ensure that this service is swiftly adaptable to organizational and technical change.

Figure 3 shows the geographical layout of the computer sites and the linking network. The Corporation data-processing bureaux are to be at Port Talbot, Sheffield (Aldwarke), Corby and Teesside. Aldwarke will also be a program-development bureau.

The major Production Planning and Control (PPC) computer installations are also shown. The development of this systems/computer strategy requires a Data Communication system which will link users via data terminals to the bureaux computers and the PPC computer installations. The operation of the Data Communication system will be similar to making a telephone call using the Post Office telephone system (*i.e.* the user will make a data call via his data terminal to the computer which he needs to use).

One difficulty which piecemeal development of a system brings with it is the problem of compatibility. Whereas telephone instruments are technically very similar, computers and terminals differ considerably, even within one organization like the Corporation. Some of BSC's computers, for example, have been provided by IBM, others by ICL. It is a compliment to the electronics industry that an additional facility offered by the Data Communication System will enable these various dissimilar computers and terminals to communicate directly with each other.

At the same time as the requirements of the Data Communications system were being established, Corporation studies demonstrated that the replacement

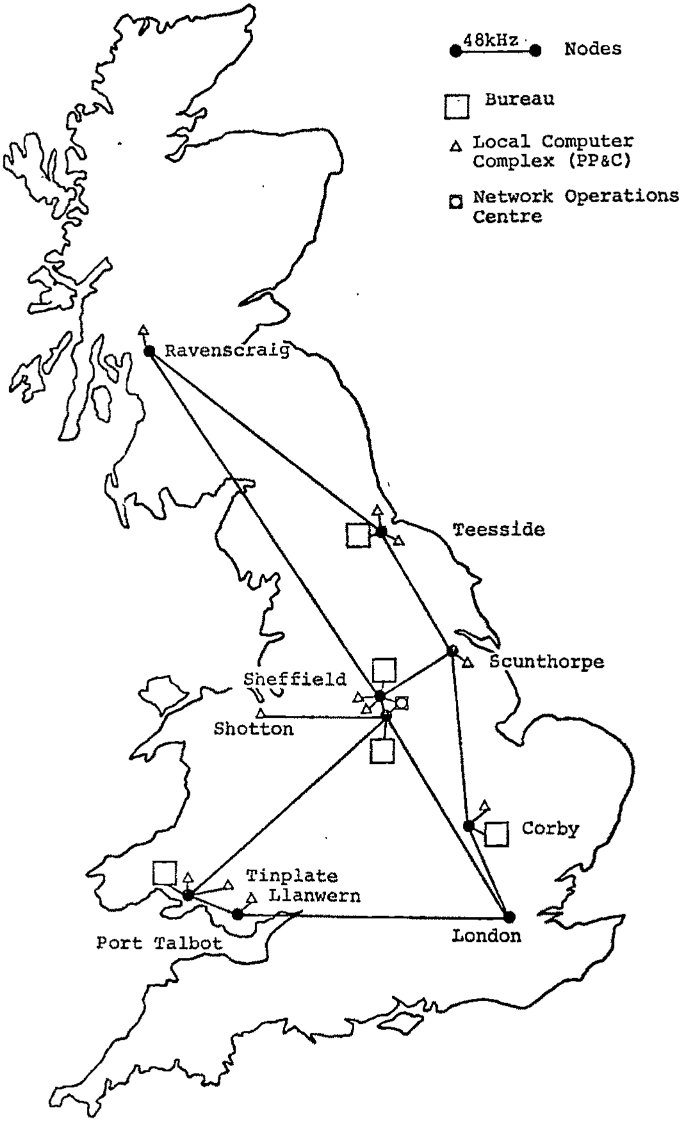


FIGURE 3: *The layout of the British Steel Corporation's Communications Network*

of the several point-to-point *speech* systems by a network based on high capacity circuits and automatic switching equipment would provide significant benefits. This would offer a 24 hours per day availability, less waiting time, and desk-to-desk dialling, as with the Post Office's subscriber trunk dialling (STD) facility.

About 80 per cent of the main trunk circuits will, in fact, be devoted to speech traffic with a considerable cost benefit over current methods.

Since the speech traffic flow patterns between BSC locations are very similar to those of the data traffic, it became clear that it was economically advantageous to use a single network for both data communication and speech purposes. Indeed, the network might also be used in the future to support other telecommunication services such as teleprinter and facsimile links.

The network will be based on the use of such high capacity, high quality lines called supergroups leased from the Post Office. Each supergroup can carry 48 simultaneous telephone conversations and transmit data at 48,000 bits per second. Individual circuits will be installed within each region linking the various local telephone exchanges and computer equipment in that region to the trunk system.

The capital cost of the whole systems and computer development programme is £61.5 m. at current prices. This covers all the computer purchases including the network and its terminals. By 1981 this will have about doubled our present stock value of data-processing machines. We hope to have the first stages of the network installed and working by mid-1977, at a capital cost at current prices of some £15 m. including the data-terminals, of which there are several hundred.

Wider information needs

I would now like to turn to the second category of information—information aimed at a broader spectrum of employees than that which I have just described. There is no point in the top management pretending that all decisions and their implications get communicated downwards quickly without distortion. This might be possible in a company of a few thousand employees, but when there are over 200,000 people on the pay roll more organized attention must be paid to this aspect since if this is not done the net result is dissatisfaction. In BSC we have put great weight on improving such communications, and in the past few years we have introduced several methods of achieving this, some of which are novel.

BSC's top management is supplied with several regular sources of information to satisfy their information needs. On a daily basis they obtain a summary of relevant news from the daily press—both national and provincial—as well as a daily notification of oversees steel information. Even if it causes confusion we report from all the national press whatever their political or editorial opinion. Some of this has a local content which affects some parts of the Corporation more than others. As a matter of interest we sell this information to others outside BSC and partly recoup our costs.

'*Steel News*', our fortnightly newspaper, is distributed to every employee. It contains an average of eight pages. We have different editions in different parts of the country, although they all carry several pages of the same national news. Two years ago we undertook a detailed readership survey of *Steel News*. We found that it had a high readership amongst both employees and their families, but one of the features least liked by the readers was the seemingly repetitive photograph of Mr J. Smith, surrounded by all his friends, receiving a clock on his retirement. We have cut down such items but included news of the moment to Works and Corporation—less to individuals. *Steel News* is much read and much appreciated by the work force. We also distribute *Steel News* to newspapers and television, and derive an extra public relations benefit when the stories are adapted for the national media. When special news items occur we bring out extra editions of *Steel News* to ensure that the work force is kept fully informed, such as a special issue in support of remaining in the EEC (on which the unions agree with the Board view) and special issues on the interim report on the closure review.

Recently we have started a monthly journal, *Steel Manager*, an internal journal aimed at our middle managers, foremen and supervisors—some 25,000 in all. This is also distributed to senior managers, directors, managing directors and Board members. This magazine, which is now three months old, is to be a forum for news, comment and discussion between middle managers and foremen on the one hand and our senior management on the other. The journal was launched because a survey showed that these employees, more than any other group in BSC, felt deprived of information about what is going on in the industry. It is a publication which will provide facts, figures and background that would not have reached these categories so early in the past, and where everyone can be frank. Although it is still early days, the signs are that it is developing along the right lines, and I have high hopes that *Steel Manager* will be a most successful bridge between our most senior management and our foremen and middle managers.

Another new idea now being used within the Corporation is newsphone. Company newspapers are excellent methods of communicating but these are not all that efficient if a story breaks the day after the paper appears. It is here that a newsphone system comes into its own. Newsphone was first introduced in our Strip Mills Division at Port Talbot and later on a larger scale at Llanwern. Here, by dialling a number on any phone, the employee can hear the current news. This is not solely news of the Corporation—although this forms the bulk of it, but it is national and social as well. A feature of the system which we are now introducing is the facility to ask questions and get them answered. This two-way communication is an improvement on the one-way system. At Llanwern, if many people ask the same question then the answer is given on newsphone. Otherwise, the questioner is answered by letter which is passed via the departmental manager to the questioner by his or her foreman or supervisor. Newsphone is now installed in our Head Office as well as in several works.

Another medium which has great potential for communication to the Corporation's employees is local radio. We are encouraging our works managers and directors to be interviewed to be able to give the facts and BSC's point of view over the air. While most of the listeners are not BSC people, the off-shift worker and families of steelworkers are able to hear the local works manager or director explain the BSC position on any newsworthy item. Incidentally, this requires that the speaker understands and supports the Corporation policy and view—itself another communication task.

One other tool of communication, which combines sight and sound, is the video film. By the very nature of the Corporation it is not possible to invite all interested parties to conferences and meetings and the most important meetings/

conferences are now being videofilmed for showing at other locations. This is a much improved method of communication over minutes of meetings and it enables non-participants to understand the nuances of arguments which quite often are not brought out in the minutes! It saves money too on transport. Electrons move much faster than humans.

We believe in the Corporation that a good manager must also be a good communicator. Communication is becoming an increasingly important component of management, and training in communication is now part and parcel of management training. Senior people are instructed on how to conduct themselves in front of both the TV cameras and the radio microphones.

Publicity and information

So far I have discussed information which is needed by the employees within the industry to perform their tasks efficiently. But a large organization, such as the British Steel Corporation, cannot act merely as a recipient of information and it is essential that we ourselves generate information to inform and educate both the public and our customers.

We publish data on our products to ensure that the customer buys the steel which best meets his needs, and we also generate information and advice on how best to use these steels. We have set up a comprehensive welding and materials selection service for structural and pressure vessel steels at Teesside. At Shotton, in North Wales, there is a steel protection service which has been established to provide information to the customer on how best to select and protect steel against corrosion. At Swinden Laboratories, in Rotherham, there is a Special Steels User Service which covers all aspects of the application of special steels. These are only three of the many customer information services which the Corporation has.

Since nationalization in 1967 we have been aware of the need to keep the general public informed about the Steel industry. In the past eight years the Corporation has launched several advertising campaigns with different emphasis. Each campaign has a purpose and an audience to whom it was essential the purpose should be directed because it attracted sales or manpower, or just good will.

One other vehicle for communicating information about BSC to the outside world is *British Steel* which is a quarterly produced by the Corporation and aimed chiefly at people outside the industry—although it is also circulated to senior management within the Corporation. This goes to MPs, customers, learned societies, universities, schools and journalists among others. It contains important articles (unedited) from customers, staff and interested parties in the Corporation's activities. This magazine complements our advertising.

Steel is a technologically advanced industry, and to educate and inform the public, especially schoolchildren and students in the technology of the industry, the Corporation distributes films on all aspects of iron and steelmaking. These films also serve the purpose of attracting potential recruits.

Closures: information supplied

The corporation gives as much notice as possible of any intention permanently to reduce the number of job opportunities at any of its plants through plant closures. The period of notice varies depending on the number of lost job opportunities involved, but for major closures the minimum period of notice was at least two years and is now one year, but with a statement each year of the following 5-year projection (including intended closures). This notice is frequently exceeded; for example, in the case of Ebbw Vale advance warning was given in 1970, some five years prior to the first stage of the closure. In other cases also, informal discussions on the formulation of the Corporation's Development Strategy have given the workforce concerned an early indication of the Corporation's intentions.

Consultations were well established long before the start of the review of the Corporation's strategy instituted by the Government some eighteen months ago. This review has resulted in the same volume of information being available to the workforce and their representatives in respect of these closure proposals as is available to management. But this does not exhaust the communications. For example, prior to the Tripartite meeting on the Scottish closures, some 200 questions, technical, financial, and commercial, were received from the union representatives, and answered!

But even under normal circumstances, there has been a period of consultation between local management and the local workforce, the length and intensity of which has varied, to explain the Corporation's proposals and the reasons for them and to consider any counter proposals put forward by the workforce. Where major closures are contemplated it has generally been the Corporation's practice to issue a detailed written brochure justifying the closure proposal on technical and economic grounds at the commencement of the consultations. Information of a commercial nature which in other circumstances it would not normally be considered prudent to reveal is also included. If appropriate, consultations continue on the way in which closures will be implemented. There then follows action by the Corporation to counsel employees affected by the closure on the possibilities for retraining, alternative employment and other associated matters.

Security of information

Concern for security is not new, for as long ago as the late 17th century Robert Boyle of Boyle's Law fame was most concerned about a paper of his which he gave to *Philosophical Transactions* to print. Henry Oldenberg, the editor, is on record as having told Boyle:

> they (your papers) are now very safe and will be within the week in print as (the printer) Mr Crook assureth, who will also take care of keeping them unexposed to the eye of a philosophical robber.

While Boyle's concern seems, in retrospect, to have been unnecessary there is in present-day industry some information which has to be controlled because it would jeopardize the interests of the company if it were released. It is, however, important to draw a clear line between such information and that which should be more freely available.

I read recently in the CBI review[3] that industrial espionage is costing British industry tens of millions of pounds every year. A pretty dark picture was painted of the consequences, especially for small or medium-sized companies, unless steps were taken to safeguard the knowledge originating from the company. The article pointed out that whereas in the past industrial espionage was confined to research and development departments it is now spreading to other departments. It is therefore even more essential than ever that companies keep confidential information in the hands of their own employees. Security depends on the employees and it is essential for them to realize the importance of secrecy, but they must not forget that there are great advantages in disseminating widely non-confidential information.

It is interesting to note that one of the first industrial spies was an iron man. In the 17th century, Mr Foley of Stourbridge, one of our earliest ironmasters, gained knowledge of his craft by touring continental foundries dressed as a wandering minstrel. Thankfully, this cannot happen today—wandering minstrels are not allowed inside steelworks!

Information collaboration

So far I have discussed the collection and dissemination of information within one industry or company. The question to be asked now is whether there could be a saving if companies collaborated in the collection of information.

I was glad to see that Aslib has taken a lead in the interchange of such information between industries. Following an Aslib conference held in November 1974, entitled 'Information Services in the Energy Industries', a meeting was held, under Aslib auspices, between representatives of the BSC, NCB, CEGB and British Gas. The purpose was to discuss ideas and suggestions made at the conference and, from these discussions it was concluded that benefits might be derived from co-operation in two main areas: first, interchange of information on energy between the information services of the four organizations; second, interchange of ideas on development of the information handling systems of the four industries. Aslib has expressed its willingness to co-operate in any investigation to determine the most profitable areas for effective co-operation and to make recommendations for organizing such co-operation.

Such a venture is to be encouraged and I would like to see a greater effort made to exchange open information between industries, universities etc. Energy is a field where the BSC, NCB, CEGB and British Gas have a common interest. The Corporation is, of course, not an energy producer but it uses 10 per cent of the UK's energy; 60 per cent of our energy input is coke; 25 per cent is oil; while the remainder is gas and electricity. Our total bill on energy is of the order of £600m. We have a need for information on energy—information which more than likely has already been collected in the energy supplying industries. Conversely, we have information on the use of energy which will no doubt be of use to other organizations. While energy is surely a fruitful field on which to start collaborating, there are probably other areas where useful exchanges can also take place.

Future

I would now like to speculate a little about the communication of information in the future. It is clear that we have not yet made full use of computers and communications networks and we will not, within BSC, appreciate entirely the advantages and flexibility of our network until it is fully operational.

In what way could the network help us in the future? As an example, travelling costs are escalating while telecommunication costs per unit of information transmitted are decreasing. The time will soon come when it will be more economical to have conferences held with each participant sitting in the comfort of his own office before a camera rather than everyone having to travel several hundred miles to a central place. This has been suggested for years, but I believe we are about to see it happen. It is cheaper to invest in 10 TV sets and 10 video tapes than to send ten people around the country to ten different places every few weeks.

A greater use will undoubtedly be made of television in the future. Recently the BBC started to carry information 'on the back' of regular programmes. When this is unscrambled it reveals information which can be displayed on a TV screen at the push of a button.

The power of such a system—known as 'teletext'—is easily appreciated and the development of this could well be of great benefit to an organization which has branches, offices and representatives all over Britain—or even all Europe or the world.

In a recent study it was suggested that about a half of the total number of colour television purchasers would want a decoder for 'teletext' in the long term. The most significant use is that for business communications. In this role companies could lease a number of pages at fixed times every day and use them to send up-to-date bulletins to all branches or agents. The receivers would store the page when it had been broadcast for viewing whenever needed.

Conclusions

I hope that I have conveyed the message that the gathering, storage and communication of information in the broadest sense is a growing business and that there is an ever increasing need for communication experts to ensure that employees are appraised of relevant happenings both inside and outside their industry. Industries must not be introspective, and in the field of computer based information a great deal is to be gained by liaison and collaboration with other industries which might well be devoting effort to extracting the same information. Inter-industry collaboration in information must be encouraged.

Last, but not least, a good manager in industry must also be a good communicator—in the widest sense of the word—and training in communication must play a larger part in managerial training in future. I hope I have convinced you of this.

REFERENCES

1 HERSCHMAN, ARTHUR. *Physics Today*, November 1971.
2 LANGRISH, J. *Nature*, 250 (614), 23 August 1974.
3 CARRATU, VINCENT. *CBI Review*, 32, Spring 1975.

BRIEF REVIEWS

STAFFORD BEER, Platform for change. London, Wiley, 1975. 457 pp. £5 (ISBN 0 471 06189 1).

It may well be

'... no one knows how to communicate
about this kind of problem
because it is so new
and the connotations
and the conventions
needed for the exchange of complex ideas
just don't exist'

but Stafford Beer certainly tries to communicate. He has given us a coherence of arguments of change in a passionate attempt to communicate the traps, the tasks and approaches to solutions that the management of complexity in the 20th century urgently invoke.

There are speeches presented between September 1969 and February 1973 to organizations as varied as the Society for General Systems Research, the Police College, the Operational Research Society at a joint plenary meeting with the Institute of Management Science, BBC Radio Three, and the Committee on Science and Astronautics of the House of Representatives of the United States of America, and including the uninvited 500th lecture not delivered anywhere in September 1970—together with personal narratives, printed on yellow paper; explanations and comments in a META language, on gold paper; and theses, on blue paper.

Platform for change is, as he had intended, 'a new sort of book'; hopefully, as he also states, 'for a new sort of world'; and certainly, believing as he did that 'THE MANAGEMENT OF INFORMATION AND KNOWLEDGE ... is tantamount to saying: THE FUTURE OF THE WORLD', of direct and immediate relevance to the Library and Information field.

He admits that the presentation may be difficult to accept at first, reading habits, as other old habits, being difficult to break, and perhaps particularly so for us. Perhaps we need such provocation into a new awareness, precisely because of our involvement with information, 'which is what changes us' and data, 'which are the raw materials of information'.

To paraphrase:

the speeches record what he actually said
the book exists to say what he actually meant

and this message from a man working seriously on the process of how you can possibly change things (and also trying to do it) achieves, as he hoped, a whole that is greater than any of its parts and an exploration not only of cybernetics as the science of effective organization, but also of man the organizer.

MILES, G. R. *and* STEINBERG, M. Between people: a new analysis of interpersonal communication. Henley-on-Thames, Science Research Associates, 1975. 360 pp. £5.45 (ISBN 0 574 17501 6).

The authors develop a conceptual framework designed to distinguish between non-interpersonal and interpersonal communication, stressing the mutual, transactional nature of communication behaviour. The ambitiousness of the aims stated in the introduction may arouse suspicion, and the transatlantic setting, and presentation, may add to an initial reluctance. This is unfortunate; the subject, and the substance of the book are well worth our full attention. To quote, 'Communication, like breathing, is necessary to our continued existence', and increased awareness of the processes and problems should help us to understand the subject and improve our effectiveness in practice, as the authors hope. They successfully develop a clear and useful conceptual distinction between interpersonal and non-interpersonal communication, consider some of the important factors that may influence an individual's ability to communicate interpersonally and include hints and comments on difficulties and problems.

They personally affirm the desirability of warmth and concern in human relationships but, realistically, realize that many situations lack these ingredients, and that some are open to manipulation. The epilogue may well be read first for its clarity in stating three viewpoints on communication that the authors reject: 'The togetherness position suffers from a misguided, muddleheaded optimism about the universality of interpersonal communication; the anomie position is born of unwarranted (and self-fulfilling) pessimism about the communicative condition of man; and the veneer position reflects a slick, cynical view of communication as superficial image building'. Their own viewpoint places a premium on choice. Individuals have the power, and the responsibility to define the nature of a communication transaction, according to the particular situation. They argue also that a concern for environmental control pervades all communication transactions. In spite of connotations of megalomaniac selfishness and 'utility' such an image may evoke, they argue persuasively and themselves repudiate control in a narrow sense.

Although the book was written primarily for students (introductory and advanced courses) and for their teachers, it has much to offer all communicators. The concepts and ideas introduced could also suggest research possibilities.

British Technology Index

CURRENT SUBJECT GUIDE TO BRITISH TECHNICAL JOURNALS

FOR TRACING AND RECALL

of $\left\{ \begin{array}{l} \text{specific} \\ \text{recent} \end{array} \right\}$ information

in the Field of Applied Science, Engineering and Manufacturing Technology

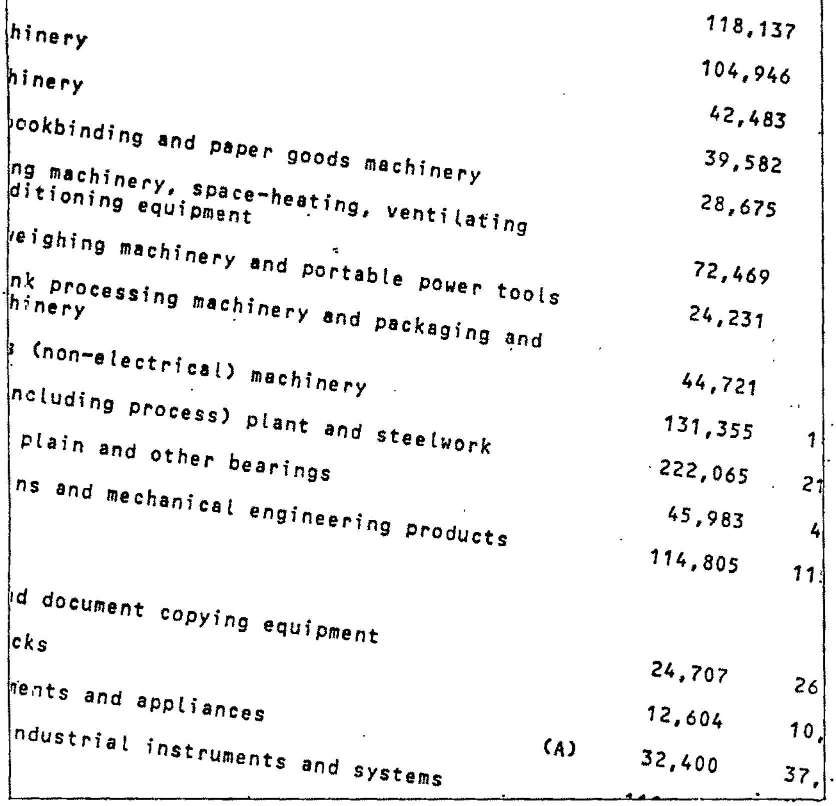
Monthly Parts and Annual Volume

THE LIBRARY ASSOCIATION

7 Ridgmount St. Store St. London, WC1 7AE

(Phone: 01-636 7543)

PQ1002 puts manufacturers' sales figures on your desk every quarter.



hinery		118,137	
hinery		104,946	
ookbinding and paper goods machinery		42,483	
ng machinery, space-heating, ventilating		39,582	
ditioning equipment		28,675	
eighing machinery and portable power tools		72,469	
nk processing machinery and packaging and hinery		24,231	
(non-electrical) machinery		44,721	
ncluding process) plant and steelwork		131,355	1
plain and other bearings		222,065	21
ns and mechanical engineering products		45,983	4
		114,805	11
d document copying equipment			
cks		24,707	26
ents and appliances		12,604	10,
ndustrial instruments and systems	(A)	32,400	37,

Department of Industry, Business Statistics Office.

A new Business Monitor, PQ1002, provides early estimates of quarterly movements in the sales of virtually every sector of the UK manufacturing industry.

The figures are collected by the Business Statistics Office from 30,000 businesses in 150 industries.

By subscribing to PQ1002, you can have the quarterly total sales figures for each of these industries on your desk within 13 weeks of the quarter covered.

Annual subscription (including postage) is 52p. Send your remittance or quote your account No. to: HMSO (Ap1), PO Box 569, London SE1 9NH.

The Library Association
7 Ridgmount Street
London WC1E 7AE

01-636 7543

Publication list
sent on request

See these and other recent publications on Stand 90

Reference Service Review

'A boon to reference librarians all over the world'

New edition / Just published

Guide to Reference Material Vol 2. 3rd Ed

(ISBN 0 85365 088 8)

Social and Historical Sciences, Philosophy and Religion, edited by A J Walford MA PhD FR Hist S FLA £11·00 (£8·80)

(ISBN 0 85365 078 0)

Literature & the Social Worker

Edited by Clare Morris. A reading list for practitioners, teachers, students and voluntary workers 80p (64p)

Introductory Guide to Research in Library & Information Studies in the UK

(ISBN 0 85365 058 6)

Edited by Patricia Layzell Ward, Jack Burkett and Philip Whiteman (LA Pamphlet No 37) £2·00 (£1·60)

Cash with your order is especially requested for single copies

Computer Provision in British Libraries

Jane Wainwright

Price: £5.75

£4.60 to Aslib members

SBN: 85142 069 9

Index to Theses

accepted for higher degrees in the universities of Great Britain and Ireland

Volume XXIII (1972/3)

edited by **G. M. Paterson** and **J. E. Hardy**

Price: £10.00

£8.50 to Aslib members

SBN: 85142 068 0

Handbook of Special Librarianship and Information Work

4th edition

edited by **W. E. Batten**

Orders may be placed now for this new edition of the well-known *Handbook*, to be published in the Autumn

3 Belgrave Square London SW1X 8PL

Aslib Publications

LIBRA INFORMATION SYSTEMS LIMITED

Specialists in mechanised retrieval systems

. . . announce the development of a dedicated *minicomputer system* designed to meet the needs of most Library/Information departments.

* Up to 100,000 references accessible on-line.
* In-house security, availability and control.
* Fast interactive searching.
* Current awareness, SDI and printed index generation.
* Pre and post-coordination facilities.
* Built in term control defined by the user.
* Full editing capabilities.
* Operated by library staff.

For further information please write to:

Technical Sales Manager
Libra Information Systems Ltd., Chaudhuri House,
Addington St., Margate, Kent CT9 1PW Ref A/10.

A Survey of British Practice in Co-ordinate Indexing in Information/ Library Units

D. J. Campbell

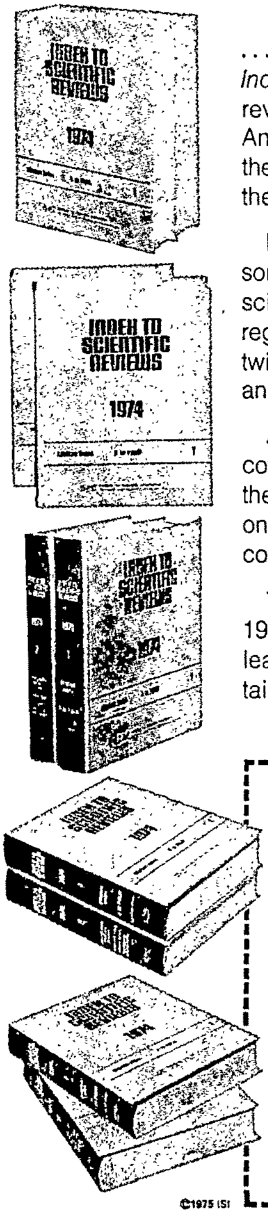
Price: £6.50
£5.25 to Aslib members

SBN: 85142 066 4

3 Belgrave Square London SW1X 8PL

Aslib Publications

ANY WAY YOU LOOK AT IT, THIS NEW REFERENCE IS THE PLACE TO LOOK FIRST



. . . because our comprehensive, multidisciplinary *Index to Scientific Reviews*™ will lead you directly to review articles on just about any science subject. And because it's organized so you can find exactly the reviews you need, in several different ways. All of them fast and easy.

Each year *ISR*™ indexes thousands of reviews in some 100 disciplines, from the world's leading science and technology journals. Plus those in the regular "review" publications. And gives you timely twice-a-year coverage through a semi-annual edition and an annual cumulation.

At only $250 per year, ISR is an effective way to cover the journal literature for those who can't afford the major indexes. Or, for those who place a premium on finding review articles with less effort, *ISR* can complement the major indexes.

The 1974 *ISR* annual is already available. The 1975 semi-annual will be out soon. Use the coupon to learn why the new *Index to Scientific Reviews* may be tailor-made for your organization.

Please send literature on your new *Index to Scientific Reviews*™ to:

Name ____________________

Title ____________________

Organization ____________________

Address ____________________

City ____________________

State
Province ________ ZIP ________ Country ________

13-439

isi® Institute for Scientific Information®
325 Chestnut Street, Philadelphia, Pa. 19106, U.S.A.
Tel: (215) 923-3300, Cable: SCINFO, Telex: 84-5305

©1975 ISI

VALUABLE
TIME
SAVER

- *Speeds new books to you and your patrons*
- *Avoids wasting time on routine acquisition decisions*
- *Insures automatic delivery of new editions and volumes*
- *Reduces order processing time*

Gale's Standing Order Service

By placing standing orders for the up-to-date reference books published and distributed by Gale, librarians will be certain that their patrons will have prompt use of new editions and new volumes in continuing series.

Standing Order Service is available for *all* Gale books of a continuing nature, such as the titles listed below. New editions of selected books published by Europa Publications are jet-freighted from London to Detroit, and are available through Gale's Standing Order Service.

All books sent under Gale's Standing Order Service come to you on 30-day approval . . . You automatically benefit from any prepublication offers . . . You may cut back or cancel your standing orders at any time.

If you wish to know whether you have specific titles on Standing Order Service with Gale, or if you have other questions, please contact our Library Services Department. (Phone collect—(313) 961-2242.)

You may place standing orders for the following reference books. Write for our complete catalog for full descriptions of these and other titles available by standing order.

Acronyms and Initialisms Dictionary, 5th Edition (ready December, 1975), $38.50.

Awards, Honors, and Prizes, 3rd Edition. Vol. 1, *U.S. and Canada* (in print), $38.00. Vol. 2, *International and Foreign* (ready September, 1975), $48.00.

Consumer Sourcebook, 1st Edition (in print), $35.00.

Contemporary Authors, Vol. 53-56 (just published), $35.00.

Contemporary Literary Criticism, Vol. 4 (just published), $35.00.

Directory of Special Libraries and Information Centers, 3rd Edition. Vol. 1 (in print), $55.00. Vol. 2, *Geographic-Personnel Index* (in print), $35.00. Vol. 3, *New Special Libraries* (inter-edition supplement), subscription, $57.50.

Encyclopedia of Associations, 9th Edition. Vol. 1, *National Organizations of the U.S.* (in print), $55.00. Vol. 2, *Geographic and Executive Index* (in print), $38.00. Vol. 3, *New Associations and Projects* (inter-edition supplement), subscription, $48.00.

Encyclopedia of Governmental Advisory Organizations, 2nd Edition (just published), $75.00.

International Foundation Directory, 1st Edition (in print), $25.00.

LIST: Library and Information Services Today, Vol. 5/1975 (just published), $45.00.

Library of Congress Classification Schedules: A Cumulation of Additions and Changes through 1973 (all 32 cumulations in print), first set, $650.00; each additional set, $375.00.

National Faculty Directory 1975, 5th Edition (in print), $85.00.

Research Centers Directory, 5th Edition, Vol. 1 (just published), $68.00. Vol. 2, *New Research Centers* (inter-edition supplement), subscription, $64.00.

Something about the Author, Vol. 7 (in print), $22.50.

Statistics Sources, 4th Edition (in print), $45.00.

Trade Names Dictionary, 1st Edition (ready September, 1975), $48.00.

World of Learning 1974-75, 25th Edition (in print), $65.00.

GALE RESEARCH CO.
BOOK TOWER • DETROIT, MICH. 48226

Published in England by Aslib, 3 Belgrave Square, London SW1X 8PL
Printed at the Alden Press, Oxford

14 NOV 1975

CALCUTTA